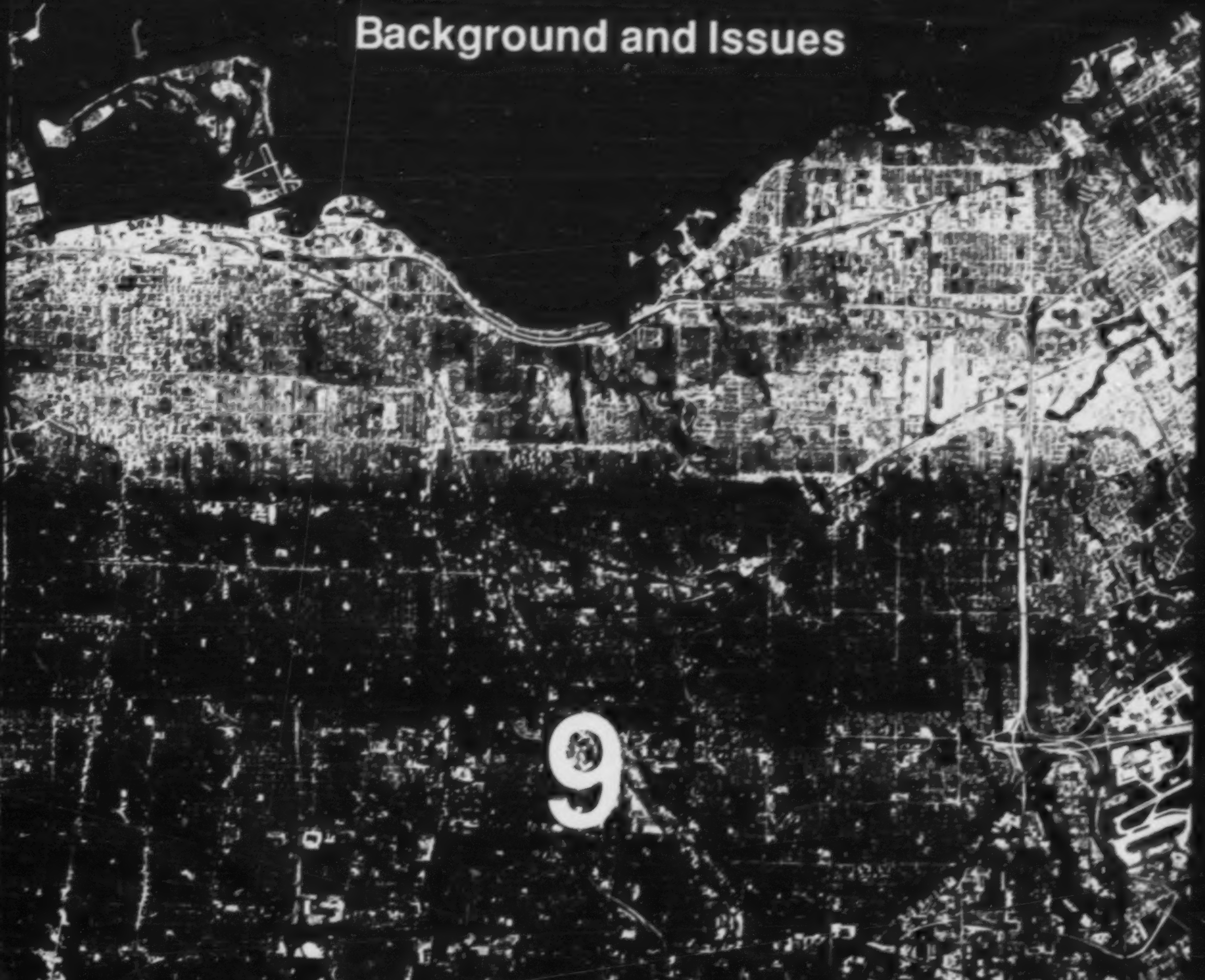
Royal Commission on the Future
of the Toronto Waterfront

Waterfront Transportation in the Context of Regional Transportation

Background and Issues



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Royal Commission on the
Future of the
Toronto Waterfront

Commission royale sur
l'avenir du
secteur riverain de Toronto

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Executive Director and Counsel
Ronald L. Doering

Commissaire
L'honorable David Crombie, c.p.

Directeur exécutif et Conseiller juridique
Ronald L. Doering

Dear Colleague:

I am pleased to provide you with a copy of the report, *Waterfront Transportation in the Context of Regional Transportation*. As previously announced, hearings relative to this report will take place on 9 May 1990. If you wish further information, please contact the offices of the Royal Commission.

This report represents the opinions of the authors and not of this Commission. Transportation affects all of those who live and work in the Greater Toronto Area. This document provides a broad overview of the major issues and examines several situations in detail. It raises a number of questions concerning future transportation requirements, options, and opportunities and is intended to be the basis for further thought and discussion on all aspects of waterfront transportation in the region.

I look forward to hearing from you.

Cordially,

Cher collègue,

Vous trouverez ci–joint un exemplaire du rapport intitulé *Le transport riverain dans le contexte du transport régional*. Ainsi qu'il a déjà été annoncé, les audiences concernant ce rapport auront lieu le 9 mai 1990. Pour de plus amples renseignements, veuillez communiquer avec les bureaux de la Commisssion royale.

Le rapport reflète les vues des auteurs et non celles de la Commission. Le transport touche tous les habitants de la région du Grand Toronto et tous ceux qui y travaillent. Le document donne un bon aperçu de certains points importants et renferme un examen détaillé de plusieurs situations. Il soulève un certain nombre de questions à l'égard des besoins futurs en matière de transport, il fait état de diverses options et possibilités et il est censé constituer le point de départ d'une réflexion et d'un débat sur tous les aspects du transport riverain dans la région.

J'attends vos réactions avec impatience et vous prie de recevoir, cher collègue, mes cordiales salutations.

David Crombie

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Waterfront Transportation in the Context of Regional Transportation

Background and Issues

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on the Future of the Toronto Waterfront
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SUMMARY

INTRODUCTION

Context and Purpose

This paper describes existing and potential future transportation demand, facilities, and services, first for the Greater Toronto Area and then for the waterfront within that context. The paper draws on a number of earlier publications by the Royal Commission, and a large number of additional reports and proposals by public and private agencies. The purpose of the paper is to provide information as background to the forthcoming hearings on waterfront transportation and related issues, and to stimulate ideas and discussion as input to the hearings.

This summary highlights some of the major points made in the paper; it is organized under the same headings as the paper itself.

Transportation Serves and Shapes Urban Areas

There is a strong "chicken and egg" relationship between land use and transportation: each causes the other and neither can exist without the other. Examples of these interactions are described in the paper, and their importance is emphasized as a basis for considering future waterfront transportation.

1. TRANSPORTATION IN THE GREATER TORONTO AREA

History

Interactions between transportation and urban form are vividly apparent in Toronto's historical development. A small town almost completely dependent on its port in the late 1700s, Toronto was greatly influenced by the coming of railway transportation in the mid–1800s, and by the end of that century had a "hub and spoke" form, with a dominant centre and development corridors along the radial rail lines linking the hub to other urban centres. This structure was emphasized in the early years of the twentieth century by the development of electric street railway lines. The twentieth century has been dominated, however, by automotive transport, which has generated and made possible a lower-density type of "spread city" residential development; the spaces between the "spokes" have been filled in, but many of the original development nodes remain, particularly the Metropolitan Central Business District (CBD). While important aspects of waterborne and rail transportation, in particular commuter rail and rail rapid transit, still serve and influence the urban area, automobiles, trucks, and buses are the dominant forms of transportation, both within and between urban areas, with air transportation being the major public mode for long-distance intercity travel.

Existing GTA Transportation System

Reflecting the above, the road network of freeways, arterial roads, collectors, and local streets is the backbone of the GTA's transportation system for both passenger and goods movements. In the GTA as a whole, comprising the regions of Durham, Halton, Peel, and York plus Metropolitan Toronto, 73 per cent of average weekday person trips in 1986 were made by automobile, 18 per cent by transit, and nine per cent by bicycle or on foot. Seven radial commuter rail lines, converging on the hub at Union Station, provide express service between suburban areas and the CBD, and the Yonge-University-Spadina and Bloor-Danforth subway lines provide rapid but more local service within Metro Toronto. Metro is also served by an extensive grid of bus routes, and bus services are also provided in 13 of the 24 GTA area municipalities lying outside of Metro Toronto, but the suburban services tend to be less well developed. The transit share of 1986 home–to–work trips reflects this, being about 33 per cent in Metro Toronto and in the range of 7 to 12 per cent in the four surrounding regions. The transit share of work trips to the central area of Metropolitan Toronto south of the CP North Toronto subdivision, between Bathurst Street and the Don River, in the peak three hours is much higher (about 65 per cent), reflecting the transit services focussed on the CBD and the peak–period automotive congestion experienced in such a concentrated area.

External connections between the GTA, its hinterland, and other urban areas are provided by all four transportation modes: road, rail, air, and water, with important passenger terminals at Union Station, Pearson International Airport, the Dundas bus station and Toronto Island Airport, and goods terminals at the MacMillan, Concord, and Agincourt rail yards, the Port of Toronto, and a variety of trucking terminals and other rail yards and ports throughout the GTA.

Recent Trends

There has been an unprecedented growth in both passenger and goods traffic during the past 25 years, reflecting strong economic and demographic trends. As a result of extensive road and rapid transit construction during the 1950s and '60s, the GTA entered that period with reserve transportation capacity and a system that was relatively well balanced between roads and transit. Expansion and improvement of the transportation system, however, did not keep up with the rapid growth in demand; as a result, there is now a substantial backlog of required transportation improvements and a growing level of traffic congestion. The outlook is for continuing strong growth in transportation demand. A basic challenge is to meet this growing demand while attempting to make up the transportation deficit of the past decades, all within the context of financial constraints and growing environmental concerns.

Possible Transportation Initiatives

A number of important transportation initiatives are under consideration or being implemented by various agencies at the provincial and municipal levels in the GTA, including:

- land–use patterns that assist transportation efficiency;
- an increased role for rail and public transportation;
- more extensive transportation management; and
- an expanded and improved road network.

Recent network expansion proposals, operational improvements, and "demand management" initiatives are described in the context of expanded provincial funding announced in the Province's 1989 budget. It is clear, however, that the "menu" of the required improvements is long and the necessary dollars are scarce.

The Port Function in the GTA

Facilities and functions of the Port of Toronto, which used to dominate the entire Inner Harbour shoreline, have now been removed to the east end of the Inner Harbour, primarily in the area between Cherry and Leslie streets. The Port currently handles mainly relatively low–value commodities (such as gravel, cement, salt, and sugar) and traffic levels have been relatively stable at about two million tonnes per year during recent years. An expected growth in container traffic, anticipated during the 1950s with the opening of the St. Lawrence Seaway, did not materialize owing to the economics of large container liners (which require rapid turnaround between ocean ports) and the efficiency of rail container services between eastern Canadian ports (e.g., Halifax, Montreal) and the GTA.

A number of public and private harbours in and adjacent to the GTA serve marine commodity flows comparable to those through Toronto's Port, and it is anticipated that future traffic growth will be modest. Nevertheless, marine traffic and the required port facilities to serve it will remain necessary for the GTA, as will appropriate road and rail links serving the port areas.

Implications for Waterfront Transportation in the GTA

There are strong interactions between the requirements and challenges of GTA transportation and those of waterfront transportation. Commuter traffic between suburban areas and the central area uses the waterfront as a corridor from areas in the east and west to the CBD. If growth in this traffic is not served by improved commuter rail and rapid transit facilities, there will be increasing levels of automobile traffic in the waterfront corridor, with negative impacts on its accessibility and amenity for local travel, recreational uses, external transportation, and goods movement. Those responsible for planning and improving the waterfront and its transportation system must therefore be concerned with broader transportation developments in the GTA.

2. WATERFRONT TRANSPORTATION

History

Marine, rail, road, and air transportation have all left their marks on Toronto's waterfront. The port function has been relocated to the east and the Railway Lands are now in the process of being converted to residential, commercial, industrial, and recreational uses. There are important opportunities opened up by these evolutionary changes, and equally important challenges to achieve appropriate mixes and densities of land use while maintaining and improving the required transportation system.

Existing Transportation System

The existing systems of roads, surface transit, rail, rapid transit, and external connections serving the GTA waterfront are outlined also in this paper. As noted, the

Central Waterfront is dominated by Union Station and related rail corridor and, for road transportation, by the Gardiner Expressway and Lakeshore Boulevard. The central, elevated section of the Gardiner Expressway, and the rail corridor, which is also elevated in much of the central area, form a double barrier between the CBD and the waterfront; while providing high–capacity transportation to and from the CBD, they have had a strongly inhibiting effect on continuous urban development, walkways, and urban amenities linking the central area to the waterfront.

Demand Trends and Outlook

While the waterfront corridor has been dominated in recent decades by regional traffic to and from the CBD, local traffic is becoming increasingly important as the port and railway functions give way to a variety of other activities. An important challenge in this regard is to achieve an appropriate balance between residential and other land uses in the waterfront and other central areas of the GTA. An increase in residential population would mean that many of those living in and enjoying the waterfront area would also be able to work in the central area, thereby reducing the demand for long work trips between suburban areas and the centre.

Inter–regional and intercity traffic is also expected to grow with the GTA, creating pressure for expansion of the two major intercity terminals in the Central Waterfront — Union Station and the Toronto Island Airport.

Challenges and Opportunities

There are many transportation challenges and opportunities to be faced in the waterfront, including the following:

- coping with through traffic in the waterfront corridor and seeking to serve it efficiently while not letting it dominate and blight the waterfront;

- setting planning and urban design objectives for the waterfront as a place, and achieving balanced residential, commercial, industrial, and recreational uses and the required transportation to serve them;
- maintaining sufficient flexibility and capability to deal with major special events, such as the 1996 Summer Olympics or World Fair 2000, either of which would have a major impact on the waterfront and its transportation.

In addressing these and related challenges, it is useful to remember that transportation is a means to an end and the basic objective is to achieve an urban place that is pleasant to be in while also being reasonably accessible and functional. The various waterfront transportation proposals listed in the following sections should be considered in this context.

Waterfront Transportation Proposals

A number of proposals have been made by a variety of public and private agencies. These are described briefly in the paper, along with some of the major advantages and disadvantages, in some instances, which have appeared in various reports and the media. These proposals include the following:

- Arterial road improvements could be made, including a westward extension of Front Street from Bathurst Street to the Gardiner Expressway west of Strachan Avenue (with widening of the latter by one lane in each direction to the Humber River), westward extension of The Esplanade from Bay Street to Bathurst Street and possibly further west to Strachan Avenue, and other improvements to north–south and east–west roadways serving the waterfront.
- There are a number of proposals for the Gardiner Expressway, in order to remove or ameliorate the barrier effect of its central, elevated section, as follows:
  - a) Replace the elevated section with improved arterial roads, a broadened and improved Lakeshore Boulevard, and expanded transit services.

b) Bury the elevated section of the Gardiner underneath the existing Lakeshore Boulevard, which would be expanded and improved into a "grand" boulevard.

c) Relocate the elevated section into a new tunnel just offshore along the Inner Harbour and sell development rights in the current Gardiner Expressway corridor and adjacent waterfront lands in order to help pay for the relocation.

d) Retain the elevated Gardiner in its current location but with improved lighting and urban design in conjunction with related development adjacent to the expressway, in order to reduce its negative environmental and barrier impacts.

There are important differences among these alternatives in terms of traffic impacts, costs, and implications for the urban and recreational environment offered by the Central Waterfront Area.

- Possible commuter rail improvements include an expanded Union Station, new and relocated GO transit stations serving the "shoulder" areas east and west of Union Station, and a possible burial of the rail corridor in the central section so that it would tunnel under the north–south arteries rather than passing over them. The latter is a very major proposal, similar in magnitude to possible relocation of the Gardiner Expressway. The Royal Commission will be considering both such proposals as it addresses its mandate to set directions for the waterfront. In the meantime, Union Station and other commuter rail improvements will continue to receive attention by the Government of Ontario, GO Transit, and the City and Metro governments.
- Among the most important transit improvements being considered for the waterfront is a possible westward and eastward extension of the Harbourfront Light Rapid Transit (LRT) line, now under construction along

Queen's Quay between Spadina Avenue and Bay Street and up Bay Street to Union Station. As described in this report, one such expansion could provide LRT service between a new GO Transit station west of the Humber River and an eastern terminal in the vicinity of Greenwood Racetrack, with direct connections to a relocated GO station northeast of Exhibition Place and a new station serving the Ataratiri development between Parliament Street and the Don River. This would provide an effective "express/local" service, with the GO Lakeshore line providing express service for longer trips, and the LRT line serving more local trips and also acting as a feeder and distributor to and from GO stations in the area. The Harbourfront LRT would be strongly integrated, as well, with the remainder of the Toronto Transit Commission network, including east–west service on the King and Queen streetcar lines and north–south bus services on most major arteries in the area. Possible further westward and eastward extensions of the Harbourfront LRT line are also described.

- A network of bicycle paths and pedestrian trails and walkways is an important component contributing to improved recreational opportunities and urban amenities in the waterfront area.
- While there are no proposals for major improvements directly affecting goods movement and port facilities in the waterfront area, reflecting the stable nature of commodity flows as noted earlier, these are important functions for the continuing viability of the GTA and provision must be made for them.
- While recent federal government cutbacks to VIA rail services have reduced intercity rail service at Union Station, a major initiative by the Ontario and Quebec governments, in conjunction with the private sector, is considering the possibility of high–speed intercity rail service in the Quebec–Windsor corridor. This option

should clearly be kept open in ongoing planning and design work affecting Union Station and the rail corridor, as should the possibility that some of the recently cut VIA services may be reinstated, possibly under different management involving the private sector.

- There has been a recent proposal for high–speed waterborne transportation, using Hovercraft technology, to provide commuter and recreational services linking various waterfront communities in the "Golden Horseshoe" of western Lake Ontario. Such a service could provide an additional link among communities between Oshawa and Burlington, focussing on downtown Toronto, with important links also to Hamilton and centres in the Niagara Peninsula which would be considerably shorter than the corresponding land links. This option will also receive consideration from the Royal Commission.

3. WHERE TO FROM HERE?

The final section of this paper lists a number of questions which the Royal Commission will be considering as it meets its mandate, including the following:

- How much transportation should be provided in the waterfront?
- What is the appropriate balance among the various modes of transportation?
- Which transportation improvements should come first?

The final section also provides a longer list of ideas and questions which can serve as criteria in developing and evaluating alternative transportation concepts for the waterfront. These include: compatibility with desired land uses; capacity, comfort, safety, and convenience; environmental "friendliness" and energy efficiency; capital and operating costs; user pay principles and financial viability; ease of integration with other forms of trans–

portation; and the extent to which a proposed transportation project can be adapted or expanded to meet future conditions at reasonable cost.

The significance of transportation as a contributor to acid precipitation, global warming, depletion of high–level ozone and local toxic effects is noted, with the comment that the issues of environmental quality and energy efficiency are growing in urgency and must be addressed in the 1990s as our society seeks to move towards sustainable development.

What Is Your Opinion?

The Royal Commission on the Future of the Toronto Waterfront invites your comments on waterfront transportation. It is hoped that the background information provided in this publication and the foregoing summary will assist members of the public in considering the options, possibly developing new ideas, and providing comments and ideas for consideration.

ABOUT THE AUTHORS OF THE REPORT

Neal A. Irwin is Managing Director of IBI Group, a broadly based consulting firm which provides transportation, planning, and design services. He has provided transportation and strategic planning advice to a wide variety of public- and private-sector clients in Canada and abroad during a consulting career of over 30 years.

F. Shane Foreman has been seconded to the Royal Commission from The Canada Ports Corporation, a federal Crown corporation, where he has had extensive experience in a wide range of port planning and administration activities including the management of the national corporate planning process, the development of port master plans and land-use plans, policy development, and corporate communications. At the Royal Commission, he is Director, Port Studies, responsible for a number of waterfront development and transportation matters.

INTRODUCTION

CONTEXT AND PURPOSE

This discussion paper starts with a description of transportation in the Greater Toronto Area and then describes and discusses transportation in the Toronto waterfront area, in the context of the larger system. At each level, that of the GTA and that of the waterfront, it provides a brief historical perspective followed by a description of the existing transportation system, recent transportation demand/supply trends, and outlooks. Possible transportation initiatives and current proposals are also described briefly, for the GTA in Chapter 1 and for the waterfront in Chapter 2. Chapter 1 also discusses the Port of Toronto and ends with a discussion of implications of GTA transportation for waterfront transportation.

Chapter 3 of the paper raises a number of key questions for consideration during the forthcoming hearings and discussions on the future of the Toronto waterfront and its transportation requirements.

This paper draws upon earlier publications by the Royal Commission on the Future of the Toronto Waterfront, and the reader is referred to them for more information and commentary on the issues addressed here. The following publications of the Royal Commission are particularly relevant: *Report of the Access and Movement Work Group, The Future of the Toronto Island Airport: The Issues,* and *Persistence and Change: Waterfront Issues and the Board of Toronto Harbour Commissioners.*

A large number of transportation-related reports and proposals have also been drawn on, most of which were prepared by or for the public-sector agencies with transportation responsibilities and interests in the GTA. A number of private-sector proposals for transportation improvements are also relevant, and several of these are referred to individually in Chapter 2. Bibliographies in the first two Commission publications mentioned above list most of the relevant source material.

TRANSPORTATION SERVES AND SHAPES URBAN AREAS

Human activities, land use, and transportation are intimately interconnected. Transportation is merely a means to an end, allowing people to move themselves and their goods from place to place in conducting their daily affairs. As soon as transportation facilities and services are put in place, however, they influence people to consider changing their travel habits or relocating their homes, workplaces or other locations of activity in order to take advantage of the new transportation provided.

The shape and development of urban areas is affected fundamentally by the type and extent of transportation available. At the same time, the pattern and density of development help to create the corridors and intensities of traffic flow which influence the type and extent of transportation provided.

Transportation can have an extremely positive impact on land use, reinforcing the accessibility and amenity of residential, commercial, industrial, and recreational areas; conversely, lack of transportation capacity can place limits on development densities or attractions which might otherwise be considered highly desirable.

It is necessary, therefore, to consider transportation, urban form, land uses, and human activities as parts of one continuum rather than as separate subjects. This paper provides many examples of these interactions.

Another important point to be remembered is that an urban region never reaches an "ultimate" condition; it is always changing in response to the locational, economic, cultural, and related behavioural decisions of its inhabitants and those in other regions. Transportation can be a major contributor to such changes, but must also be able to adapt to changes imposed by other forces.

This paper is meant to inform its readers regarding past trends and forces, future prospects, and transportation proposals which are now "on the table". The authors hope it will stimulate questions, suggestions, and discussion to assist the Royal Commission in achieving its mandate.

1. TRANSPORTATION IN THE GREATER TORONTO AREA

HISTORY

The influence of transportation access and routes on Toronto's evolving urban form is illustrated in Exhibit 1.

The Age of Waterborne Transportation

When Toronto was founded as the Town of York in the late 1700s, it was almost entirely dependent on water transportation for its connections with the outside world. Movement within the Town was on foot or horseback, or by horse–drawn conveyance. By necessity, therefore, the Town was small, compact, and close to the sheltered harbour that had strongly influenced its original growth.

During the first half of the 19th century, the Town expanded, as did the limited network of unpaved roads serving it, but waterborne transportation remained the main link to the outside world.

When the railways reached Toronto in 1850, they increased the capacity of the land transportation system a hundred–fold and its speed by five or ten times. In the following several decades, radial rail lines were constructed, linking Toronto's centre to the southwest, west, north, and east. Urban settlements grew up around the stations and along the rail lines, leading to the "hub–and–spoke" urban form partially illustrated in Exhibit 1. This kind of development, like rail transportation, predominated throughout the remainder of the 19th century and into the early years of the 20th century.

After 1900, electric streetcars were an important urban transportation mode, further strengthening the hub–and–spoke form of the area, thanks to "radial" streetcars that went as far as Port Credit to the west, Woodbridge to the northwest, Sutton to the north and West Hill to the east. They also allowed greater development densities on major arterial roads, particularly in the City of Toronto, and in the area to the north and west that is now part of the City of York.

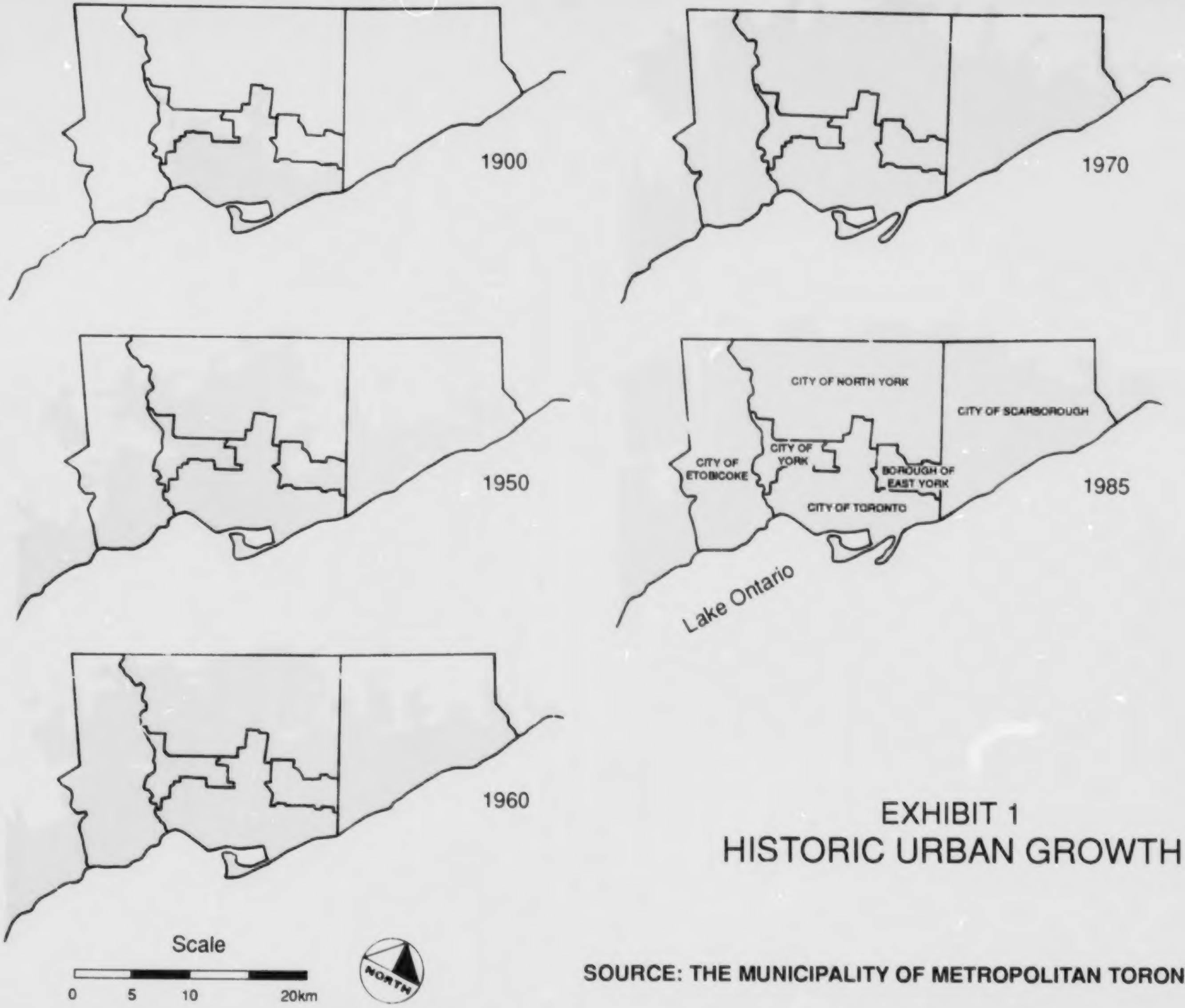

1900
1970
1950
CITY OF NORTH YORK
CITY OF SCARBOROUGH
CITY OF ETOBICOKE
CITY OF YORK
BOROUGH OF EAST YORK
CITY OF TORONTO
1985
Lake Ontario
1960
Scale
0
5
10
20km
NORTH

EXHIBIT 1
HISTORIC URBAN GROWTH

SOURCE: THE MUNICIPALITY OF METROPOLITAN TORONTO

The Age of Automotive and Air Transportation

The development of the automobile early in the 20th century and the rapid expansion of the road network during the following decades filled in the areas between the rail line "spokes". However, before World War II, the influence of the original rail and radial interurban streetcar lines persisted in the form of higher development densities in the rail corridors.

As a result of expansion, increasing auto ownership, and extensive road building after World War II, urbanization spread more uniformly throughout the Greater Toronto Area, as shown in Exhibit 1. The growing importance of air transportation led to expansion of Malton Airport to the present complex of terminals at Pearson International Airport, as well as to industrial and commercial development in the surrounding area. The strong continuing shift from rail to truck as a method of moving goods also contributed to more sprawling industrial areas and to increased highway traffic.

Within the "spread city" that has been both generated and made possible by automotive transportation, nodes and corridors of denser development have either remained from earlier times or have taken place in corridors and at stations served by the rapid transit lines and GO Transit (commuter rail) services introduced in the past 35 years.

Toronto provides clear–cut evidence that transportation affects the shape or form of a city, a process that undoubtedly is still occurring; in the same way, the resulting urban structure produces transportation demands that influence the efficiency and effectiveness of the transportation system.

EXISTING GTA TRANSPORTATION SYSTEM

There is a substantial network of major road, commuter rail, and rapid transit facilities serving the Greater Toronto Area (defined here as the five regional municipalities of Durham, Halton, Metropolitan Toronto, Peel, and York, and the 30 area municipalities contained within them).

Roads and Surface Transit

The road network is dominated by limited–access highways: the Queen Elizabeth Way, highways 400, 401, 403, 404, 409, 410, and 427, which were built and are operated by the Ontario Ministry of Transportation, and two major highways — the Gardiner Expressway and the Don Valley Parkway — owned and operated by Metropolitan Toronto.

Each of the five regional municipalities and the 30 area municipalities comprising the GTA owns and operates a network of arterial, collector, and local roads.

Bus, trolley coach or streetcar surface transit services are provided on most of the arterial roads. The Toronto Transit Commission (TTC) provides these and related rapid transit services within Metropolitan Toronto and for a small number of cross–boundary routes. Surface transit services are also furnished by area municipalities in other parts of the GTA, including Mississauga, Oshawa, Brampton, Burlington, Oakville, Markham, Vaughan, Pickering, Ajax, Whitby, Aurora, Newmarket, and Richmond Hill. Commuter bus services are the responsibility of GO Transit. The regional municipalities of York and Durham are considering establishing regional transit services or having the regional government co-ordinate municipal transit services and interconnections in the area.

Rail and Rapid Transit

The system is made up of the seven radial commuter rail lines operated by GO Transit; the Yonge–University–Spadina and Bloor–Danforth subway lines; the Scarborough Light Rapid

Transit (LRT) extension at the east end of the Danforth line; and the Harbourfront LRT (now under construction), which links Union Station to Queen's Quay and Spadina Avenue.

There are other rail lines serving the GTA, including those used for freight movements and for VIA Rail's intercity passenger services. This extensive rail network is a major transportation resource capable of more intensive use for the movement of both passengers and goods.

External Connections

The rail lines and highways described above have extensive connections to the hinterland around the GTA and to other urban centres and regions throughout Canada and the United States. Union Station, located in the Metropolitan Central Business District (CBD), is the major rail transportation hub for the GTA, while a number of major rail freight yards (e.g., the Concord and MacMillan yards, operated by CN in the Town of Vaughan, and the Agincourt yard in Scarborough, which is operated by CP) are the GTA's main rail freight terminals.

Pearson International Airport, located in the City of Mississauga immediately northwest of Metropolitan Toronto, is the area's major air terminal, with smaller airports on the Toronto Islands and at Buttonville in the Town of Markham, as well as north of Oshawa and in Hamilton west of the GTA.

The Port of Toronto, while playing a relatively minor role in the GTA, is an external connection for transporting goods and people by water. Port facilities and the flow of commodities are now concentrated at the east end of the Inner Harbour and at a number of other ports and harbours along the "Golden Horseshoe" shoreline of Lake Ontario (see section later in this chapter titled "The Port Function in the GTA").

RECENT TRENDS

As noted earlier, the demand for transportation services is strongly influenced by the shape and density of urban settlements. It is similarly influenced by trends in demography, economics, and other related factors that may have a profound impact on the number of vehicles on the road, the number of riders using the transit network, the need to move goods, and the extent to which these demands regularly occur at the same time and create "peak periods" and traffic congestion.

Changes in the Supply of and Demand for Transportation

There is little doubt that, over the past ten to 15 years, transportation demand in the GTA has been growing faster than the growth in new roads, transit services, terminals and parking, etc. (as illustrated in Exhibit 2). All residents in the GTA have experienced the effects of growing traffic congestion — more and longer delays, the need to allow more travel time because the location and extent of delays are unpredictable — and have paid the resulting economic penalties: increased operating costs, more accidents, loss of time, and increased costs of goods and services.

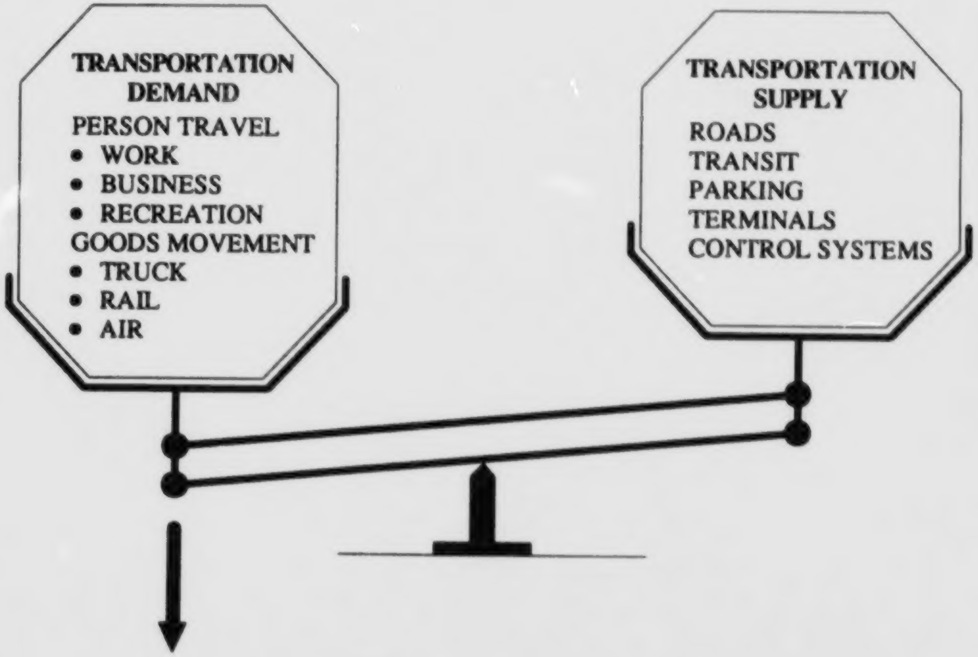
Reasons behind Increased Transportation Demand

While population growth in the GTA in the 25 years between 1961 and 1986 was substantial (77 per cent), employment grew even more (142 per cent), and the growth in daily trips was larger still (157 per cent). The number of daily trips per capita has increased by about 1.5 per cent per annum or 45 per cent over the 25 years, reflecting a number of demographic, economic, and transportation trends:

- Following the unprecedented drop in births in the mid–1960s, marking the end of the 1946–1966 "baby boom", the average household size dropped from 3.8 persons in 1961 to 2.8 in 1986. As fewer children were

EXHIBIT 2

THE TRANSPORTATION DEMAND/SUPPLY BALANCE IS SHIFTING



TRANSPORTATION DEMAND

PERSON TRAVEL
- WORK
- BUSINESS
- RECREATION

GOODS MOVEMENT
- TRUCK
- RAIL
- AIR

TRANSPORTATION SUPPLY

ROADS
TRANSIT
PARKING
TERMINALS
CONTROL SYSTEMS

RESULT: INCREASING CONGESTION
INCREASING DELAYS, UNRELIABILITY
INCREASING ECONOMIC COSTS

born, more women joined the work force, and the number of adults per household increased. These factors led to an increase in travel because adults travel more than children and because each household now generates more work trips owing to the larger number of bread winners per household.

- Increased prosperity after World War II resulted in higher real incomes and widespread car ownership; increased participation in the labour force gave people both the need and the means to travel by vehicle to work and for other purposes.
- In the same period, the construction of freeway networks and the demand for quicker and more reliable door–to–door deliveries produced a major shift — from rail to truck — in moving goods, thus adding vehicular demand to the burgeoning passenger travel by road.

These trends are summarized in Exhibit 3. At the same time that the number of daily trips per capita increased, the average distance travelled per trip grew longer: from approximately 11.4 km in 1961 to 15.1 km in 1986. Among the reasons:

- The scale of the Greater Toronto Area has greatly increased.
- There is ongoing rapid household formation: the "baby boomers" are expected to buy or to have bought their first houses between 1980 and 2000, creating very strong demand (similar to that of returning servicemen in the 1950s) for single family houses. These can be provided most economically on new, suburban land, located farther and farther from the Metropolitan Central Business District. In fact, high land costs generated by 3rapid growth have pushed the locations for new housing into exurban developments beyond existing urban envelopes, lengthening work and other trips even more.

EXHIBIT 3

GTA GROWTH: 1961–1986

	1961	1986	1961–1986 % Increase
• Population	2,106,000	3,733,000	77%
• Employment	846,000	2,049,000	142%
• Daily trips	2,948,000	7,577,000	157%
• Daily trips per capita	1.40	2.03	45%
• Average work trip length	11.4 km	15.1 km	33%
• Car ownership per capita	0.30	0.52	73%

Reasons for More Trips Per Person

- More adults per household
- More women in the work force
- Higher real incomes and car ownership
- Goods movement shift from rail to truck

Reasons for Longer Trips

- Greater scale of GTA
- Rapid household formation
- High land costs and more suburban housing
- More households with 2+ workers
- Shortage of rental accommodation

Note: Transportation data are drawn from Statistics Canada, The 1964 MT Arts Survey and The 1986 Transportation Tomorrow Survey.

- The fact that many households have two or more adults in the labour force often makes it impossible to live close to both jobs; therefore, at least one member of the family may have a longer distance to travel to work.
- Rental accommodation tends to be located in established urban areas, where workplaces and shopping and other amenities are often nearby. The extreme shortage of rental accommodation in the GTA and the high cost of home ownership have made it increasingly difficult for those wishing to live in such areas to find affordable residences there. Forced to live in suburban areas, where land and housing costs are lower, they face longer commuting distances than would be the case if more rental accommodation were available near the urban core.

As can be seen from Exhibit 3, in 1986, each person made, on average, 45 per cent more trips by all modes of transportation than in 1961. Since, on average, each trip in 1986 was 33 per cent longer than in 1961, the transportation system by 1986 had to cope with a 93–per–cent increase relative to 1961 in the number of kilometres travelled by each person each day. Compound this by the 77–per–cent growth in population in the GTA and it can be seen that the total person–kilometres of travel demand have almost certainly more than tripled since 1961. Similar increases in truck traffic have also been experienced. Our present transportation problems become easier to understand in this context.

Trends similar to those within the GTA have been occurring for interurban and recreational trips that cross the GTA boundaries. It is hardly surprising, therefore, that the strains on road capacity and the delays experienced in air transport at Pearson International Airport are receiving widespread publicity.

The Transportation System Has Not Kept Pace

As shown in Exhibit 4, since World War II, the provincial and municipal governments have provided substantial new transportation facilities in the area that now comprises the GTA. The Province built the Queen Elizabeth Way just before World War II and highways 400 and 401 following the war. All have been substantially widened since they were built (work that continues), and added links in the network of super highways include highways 427, 403, 404, 409, and 410. Construction of Highway 407, located in the Highway 7 Corridor, is now under way near Highway 400.

Metropolitan Toronto constructed the Gardiner Expressway and the Don Valley Parkway and planned a number of other links in the expressway network serving Metro: the Highway 400 extension south to the Gardiner, the Scarborough Expressway linking the Gardiner to Highway 401 in the east, the Crosstown Expressway, and the Spadina Expressway connecting it to Highway 401 and then north.

These expressways were rejected by a public increasingly sensitized to environmental and urban quality issues, although Mount Pleasant Road was extended south of St. Clair to Jarvis Street, the Allen Roadway was built as far south as Eglinton, and Black Creek Drive created an extension of Highway 400 south to St. Clair. Other arterial road improvements were also made: for example, Eglinton Avenue, which was widened and improved east and west of its central section.

During the same period, Metropolitan Toronto and the surrounding municipalities moved to complete their grids of arterial roads, and this work is still ongoing. Once again, public pressure to maintain neighbourhood integrity and the environment has prevented Metropolitan Toronto and other municipalities from completing a number of missing links in arterial road networks.

EXHIBIT 4

MAJOR GTA TRANSPORTATION IMPROVEMENTS: LAST 40 – 50 YEARS

	Date Opened
Roads	
QEW	1939
Hwy. 400	1951
Hwy. 401	1952
Gardiner Expressway	1958
Don Valley Parkway	1961
Hwy. 427	1955
Hwy. 403	1985
Hwy. 404	1967
Hwy. 410	1976
Hwy. 407	construction started 1988
Arterial grid completion	ongoing
Transit	
Yonge Subway	1954
Bloor/Danforth Subway	1966
University/Spadina Subway	1963/1978
Metro–Wide TTC	post 1954
Other transit systems	ongoing
Commuter Rail (GO Transit)	
Lakeshore	1967
Georgetown	1974
Richmond Hill	1978
Milton	1981
Bradford	1982
Stouffville	1982

Metropolitan Toronto built the first leg of the Yonge Street subway in the mid–1950s, followed by the University/Bloor–Danforth subway, the Spadina subway, and the Scarborough Rapid Transit extension of the Bloor subway from Kennedy Station to the Scarborough City Centre/McCowan Road.

During the same period, the TTC system, under the aegis of Metropolitan Toronto, was reshaped to become a Metro–wide authority providing a grid of frequent bus, streetcar, and trolley coach services linked by free transfers and convenient access to the subways. As noted earlier, other transit systems were also established and/or expanded, for example in Oshawa, Mississauga, Oakville, Burlington, Brampton, Markham, Vaughan, and Richmond Hill.

As new development moved farther from the Metropolitan Central Business District (the "tidal wave" urban growth phenomenon), the provincial government realized that the existing radial network of rail lines could be used to provide commuter rail service linking areas beyond the Metro boundary to the district surrounding Union Station. GO Transit was established and, over time, a high level of service was implemented on the two Lakeshore lines, then on five routes joining Milton, Georgetown, Bradford, Richmond Hill, and Stouffville, respectively, to Union Station.

Governments invested heavily in transportation infrastructure in the 1950s and 1960s, when public funds were less restricted than they are now, making it possible for the new Metro regional government to plan and build area transportation in an integrated way for the entire urbanizing area. However, the pace of new transportation construction, particularly for facilities serving built–up areas, tended to slacken in the 1970s and 1980s, for several reasons: provincial spending priorities began to emphasize social, educational, and health requirements; environmental concerns made approval more difficult to obtain; and development spilled over into an increasing number of municipalities beyond Metro Toronto's boundaries.

As a result, it is perhaps not exaggerating to say that parts of the GTA have been "coasting" for much of the past one or two decades with development being based on major transportation infrastructure constructed in the 1950s and 1960s. These facilities and the new roads and transit facilities and services introduced subsequently have served the area well but they have not been able to keep up with the rapidly growing transportation demand documented in the previous section.

The result has been a losing battle against congestion. As shown in Exhibit 5, some of the worst areas are: those that cross the Metro–Mississauga boundary and the Credit River in Mississauga; along the Highway 7 corridor in York Region; across the north Metro boundary; along the 401 Corridor in Durham, Metro, and Peel regions; and in the QEW/Highway 403 corridors in South Peel and Halton. There is serious peak–period congestion along the entire length of Highway 401 lying within the GTA, particularly in the stretch south of Pearson Airport, between Islington Avenue and Highway 427 — which, during the past decade, has probably become Canada's biggest highway bottleneck.

Demographic and Transportation Pressures Will Persist

Exhibit 6 shows estimates of trends between 1986 and 2011, using the same land–use and transportation variables shown in Exhibit 3.

While there are always uncertainties in estimates of the future, the demographic and related economic factors involved are such that the 2011 estimates are felt to be reasonably representative of travel demand some 20 to 25 years from now. As indicated, considerable population and employment growth is expected, with commensurate increases in daily trips. The average work trip length is expected to continue increasing (from 15.1 to 17.4 kilometres, or a 15–per–cent increase) and the number of daily trips per capita is expected to increase by about 10 per cent.

EXHIBIT 5

THE LOSING BATTLE AGAINST CONGESTION

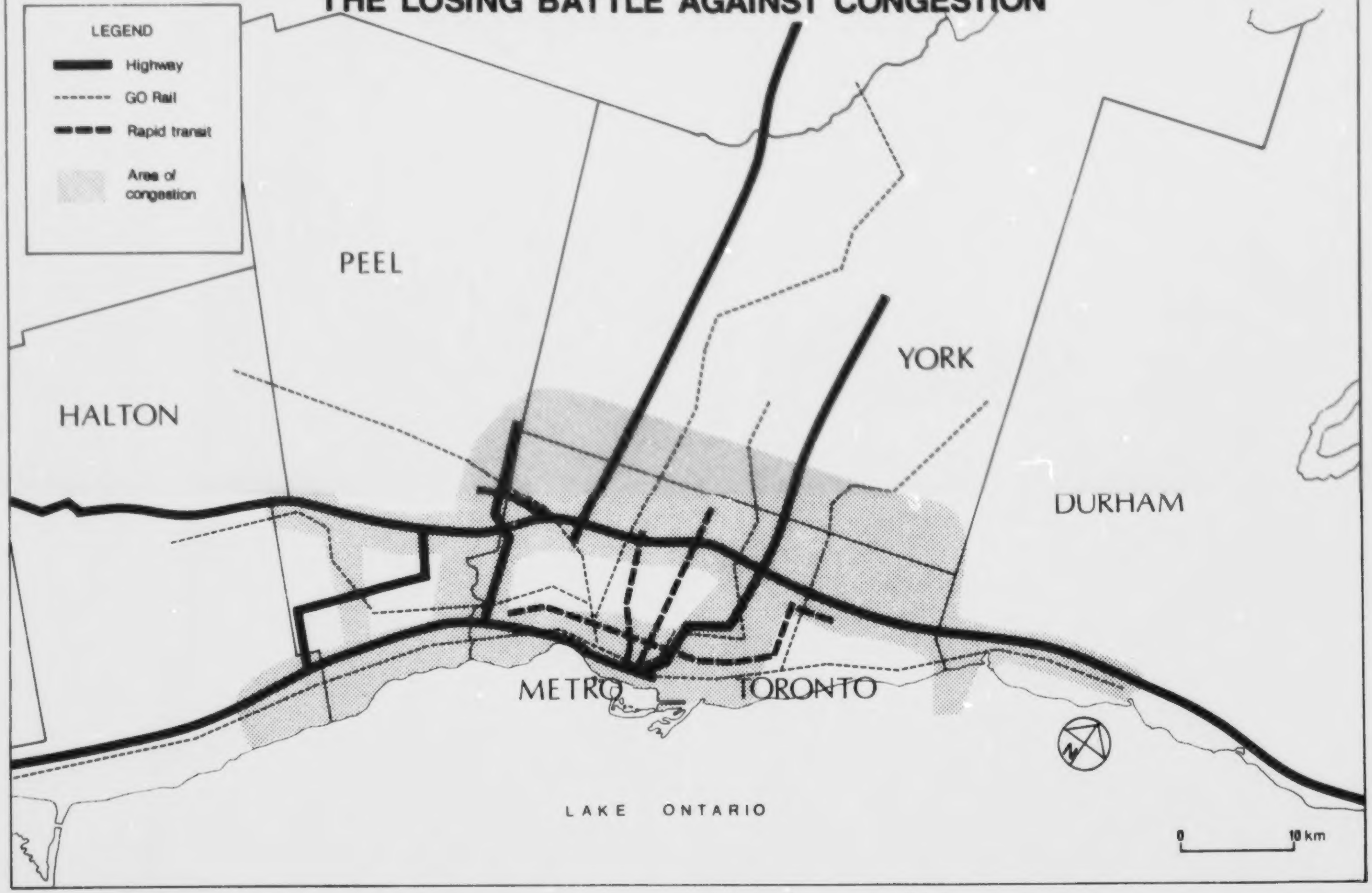

LEGEND
Highway
GO Rail
Rapid transit
Area of congestion
PEEL
HALTON
YORK
DURHAM
METRO TORONTO
LAKE ONTARIO
N
0
10 km

EXHIBIT 6

ANTICIPATED DEMOGRAPHIC AND TRANSPORTATION DEMAND TRENDS

	1986	2011	1988–2011 % Increase
• Population	3,733,000	5,438,000	46%
• Employment	2,049,000	3,259,000	59%
• Daily trips	7,577,000	12,143,000	60%
• Trips per capita	2.03	2.23	10%
• Average work trip length	15.1 km	17.4 km	15%
• Car ownership per capita	0.52	0.55?	6%

Trend Indicators

- Small, more adult households
- High incomes/car ownership
- Saturation of female labour force levels
- Slower rate of household formation
- Saturation of rail–truck goods movement shift

Includes Metro, Durham, York, Peel, Halton

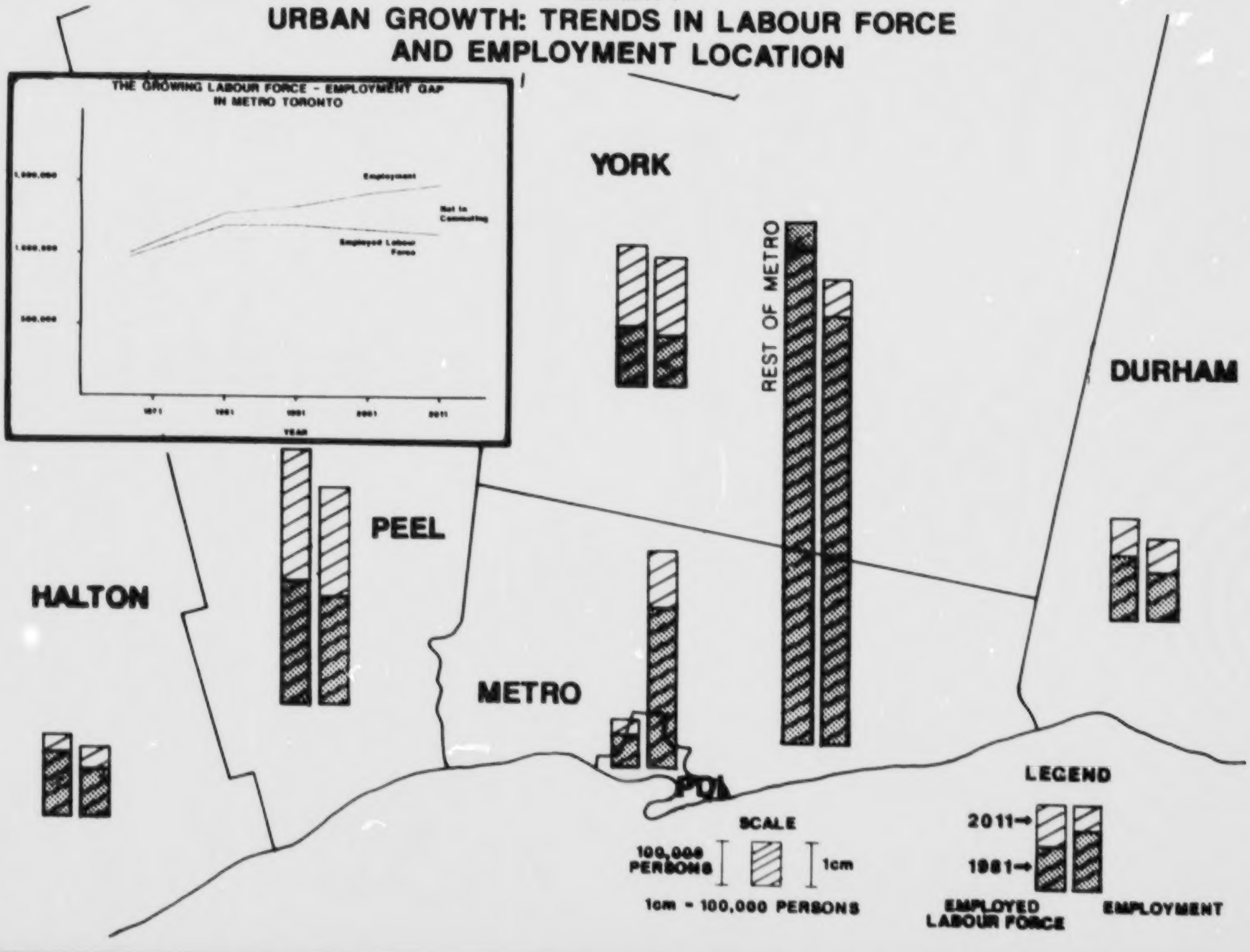
The increased travel demand is expected to be driven by continuing but much smaller declines in average household size, a high number of working adults in the population, high real incomes, and high car ownership. Growth rates of other contributing factors are not expected to continue at recent levels, however: for example, the rate of entry of women into the labour force is reaching saturation levels and, as noted earlier, the demand for first house purchases by "baby boomers" will begin dropping by the end of this decade. The ratio of jobs to people will start to decline following 2011 as the first members of the baby boom generation reach retirement age, leading to decreasing numbers of work trips per household. Similarly, the shift of goods movement from rail to truck is saturating and is not expected to fuel the growth of truck traffic as much as previously.

Speaking somewhat simplistically, and assuming that future immigration levels remain similar to current levels, it can be said that the next ten or fifteen years may be the worst in terms of catching up with the backlog and meeting rapidly growing transportation requirements. After that, the imperative for more new facilities and services may slacken somewhat, although citizens of the day will be faced with much greater costs for maintaining and operating a larger transportation system, without the added tax revenues of a rapidly growing population. If immigration rates increase during the next 25 years as the rate of natural population increase levels off, future increases in transportation demand will be correspondingly higher, as will the need for increased investment in transportation improvements.

Offering a somewhat more detailed look within the GTA, Exhibit 7 shows anticipated "unconstrained" trends in the growth of labour force and employment within the five regions making up the GTA. As indicated, while a modest increase in employed labour force is anticipated in the Metro Central Business District, a decrease is expected in the

EXHIBIT 7

URBAN GROWTH: TRENDS IN LABOUR FORCE AND EMPLOYMENT LOCATION


THE GROWING LABOUR FORCE - EMPLOYMENT GAP
IN METRO TORONTO
1,500,000
1,000,000
500,000
Employment
Net In Commuting
Employed Labour Force
1971
1981
1991
2001
2011
YEAR
YORK
REST OF METRO
DURHAM
PEEL
HALTON
METRO
PDA
SCALE
100,000 PERSONS
1cm
1cm - 100,000 PERSONS
LEGEND
2011→
1981→
EMPLOYED LABOUR FORCE
EMPLOYMENT

rest of Metro, such that employed labour force within Metro as a whole is expected to drop somewhat between 1981 and 2011. In contrast, very substantial increases in employed labour force are anticipated in all of the regions surrounding Metro, accompanied by significant increases in employment (jobs) in all five regions, including Metro. This means, as shown in the small inset graph of Exhibit 7, that there will be a growing labour force–employment gap in Metro Toronto which will have to be met increasingly by net in–commuting from the surrounding regions.

Resulting from these trends, there will be continuing pressures to accommodate radial trips crossing the Metro boundary and substantial travel growth within each of the surrounding regions, with somewhat less travel growth pressure in Metro except to serve the growth in cross–boundary trips, about one–third of which are bound for the Central Business District. This has implications for the location and type of new transportation facilities and services (e.g., GO Rail, which is well suited to long, radial trips) which will be addressed further below.

This demand for long, radial work trips could be reduced if more population growth occurs in Metro Toronto, through redevelopment at greater densities, and if more employment growth occurs in suburban areas. This is an important example of the direct impact of land–use form and mix on transportation demand patterns. The provincial Office for the Greater Toronto Area is currently studying the impact of several "generic" urban structure concepts on the GTA's infrastructure requirements and costs over the next 30 years. One of the concepts under study will quantify the above transportation impacts based on an extension of recent development trends. Another will illustrate the effect of "nodal" urban structure on transportation demand patterns and increased transit use.

It might be argued by some that we cannot afford to implement the necessary new transportation facilities and services and that we should let congestion serve as a regulator of transportation demand to an increasing degree. There are, however, very substantial economic and social costs associated with transportation deficiencies. In the transportation area, these include increased operating costs, increased fuel consumption, and higher accident levels. In the environmental area, they include increased air pollution because of higher fuel consumption and less efficient operation of vehicle engines in stop–and–go conditions. In the economic field, they include increased goods movement costs, the increased time cost for travellers, and loss of economic opportunities resulting from lower productivity and profits. Such increases can be expected to reduce the economic competitiveness of the GTA relative to other metropolitan centres in Canada and other countries. There are also costs in terms of land use and urban quality, to the extent that the transportation system is not able to support and help shape desired urban form because of faulty performance.

Finally, letting the transportation system "run down" is a very uneconomic proposition as has been learned in recent years from the rapid deterioration of parts of the Interstate Highway System in the U.S. If roads and other elements of transportation infrastructure are allowed to deteriorate beyond a certain point, it becomes much more costly to maintain and rehabilitate them than it would have been if steps along these lines had been taken earlier. It follows, therefore, that if we do not keep the transportation system in good shape on a continuing basis we are simply handing our children a massive financial and functional problem, to be faced ultimately at a time when population and economic growth rates may be declining as noted earlier.

POSSIBLE TRANSPORTATION INITIATIVES

Various Initiatives Are Possible

Four types of initiatives are identified for improving the transportation demand/supply situation:

1. land–use patterns that assist transportation efficiency;
2. an increased role for public transportation;
3. more efficient transportation management; and
4. an expanded road network.

Land–Use Patterns That Assist Transportation Efficiency

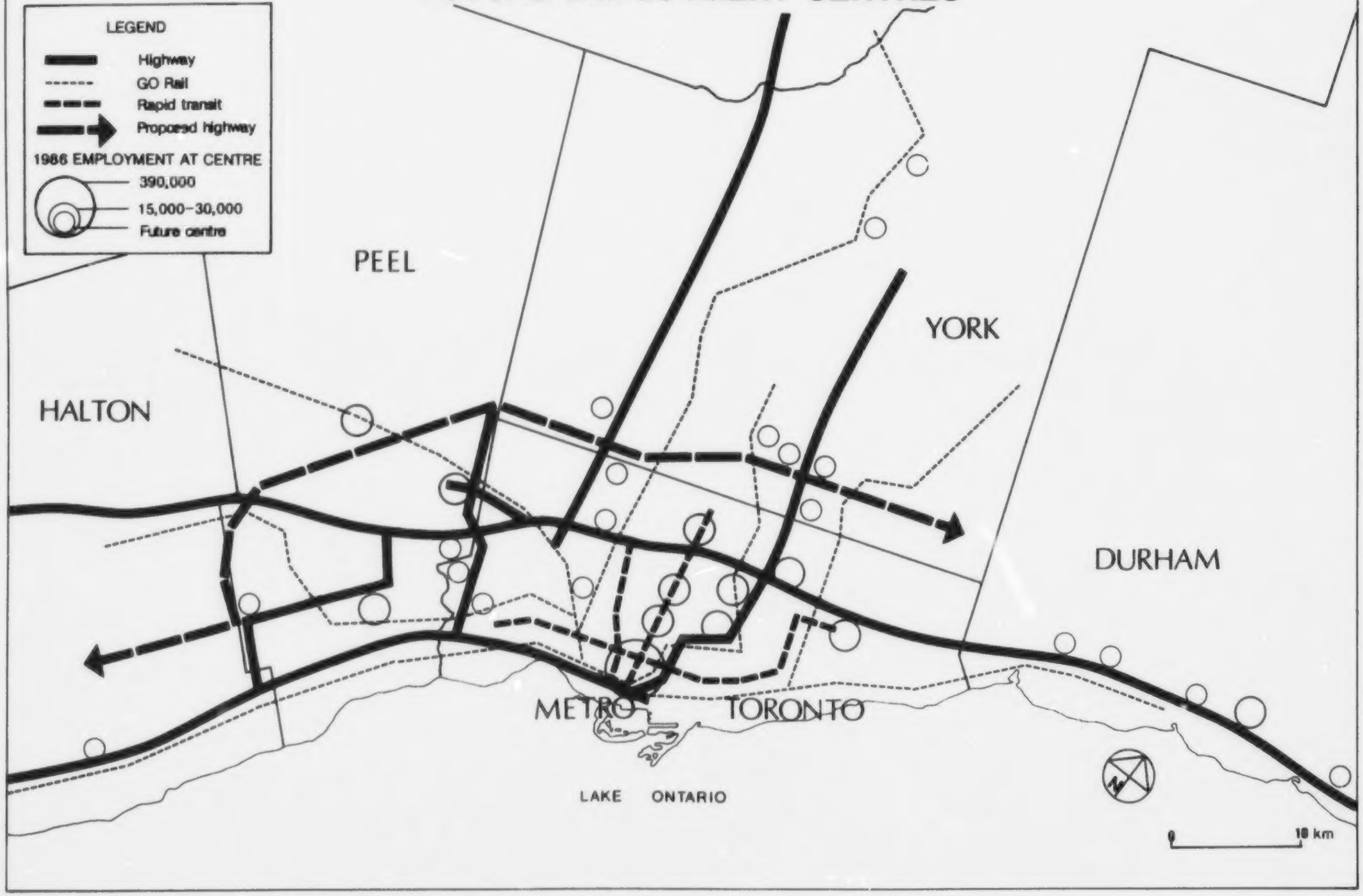
The primary aim of land–use initiatives in this area is to provide a better balance between the numbers and types of people and jobs in each part of the GTA and a more compact urban structure such that trips will be shorter and will be more easily served by transit. Means of achieving this include the encouragement of commercial and industrial subcentres outside of the Metro downtown area: the policy of "deconcentration" being followed in Metro Toronto under its Metroplan (of which the North York and Scarborough city centres are prime examples) and by Mississauga with its City Centre and other municipalities in the GTA. Nodes and corridors of higher–density development, served by rapid transit and high–frequency bus routes, help to increase transit use by increasing pedestrian access to transit facilities and making high–frequency service more economic.

Another initiative, which has received some consideration recently but could be further studied, would be greater use of the existing housing stock within Metro Toronto by reducing limitations on flats and apartments in houses (e.g., such as those in North York). Selective loosening of such regulations would serve the dual purpose of helping to meet the unserved demand for rental accommodation in the GTA and probably reducing the length of work trips by allowing more people to live in Metro rather than having to move to the far suburbs for housing accommodation. Recent initiatives by Metro Toronto and the City of Toronto to consider intensified population levels along major arterial roads and on large redevelopment sites (e.g., the Ataratiri community between Parliament Street and the lower Don River) will also have the same effect. A related initiative is the Province's policy of "affordable housing"; a broader mix of housing types in all parts of the GTA including the suburbs will allow those with lower and medium incomes who work at the many service and industrial jobs in all regions to live closer to their jobs, thereby helping to shorten average work–trip lengths and vehicle–kilometres of travel.

Exhibit 8 shows some of the future employment centres planned throughout the Greater Toronto Area. The size of the circle in each case provides an indication of the 1986 employment in each centre. The dominance of the Metro Central Business District as an employment centre is emphasized; while this will continue over the next 25 years, its importance may slowly decline relative to the total employment in the other centres, such that the self–sufficiency of the rest of Metro and the surrounding regions in terms of job opportunities may increase, thereby helping to limit future increases in work–trip lengths. However, the greater dispersion of workplaces in suburban locations will make it harder to accommodate such trips by public transit unless a more compact, clustered urban form is adopted which is easier to serve by transit than the more spread–out urban form now occurring in suburban areas. Recent growth in such areas and widespread experience in U.S. suburban areas has demonstrated that a higher transit market share will be required to serve them in the future and provide the capacity for continuing growth.

EXHIBIT 8

FUTURE EMPLOYMENT CENTRES


LEGEND
Highway
GO Rail
Rapid transit
Proposed highway
1986 EMPLOYMENT AT CENTRE
390,000
15,000-30,000
Future centre
PEEL
HALTON
YORK
DURHAM
METRO
TORONTO
LAKE ONTARIO
N
0
10 km

An Increased Role for Public Transportation

An increased role for public transportation is essential in order to make more efficient use of land devoted to transportation rights–of–way and to use existing road capacity more efficiently. This is because a transit vehicle can carry many more persons than can the two or three automobiles it replaces on the road and because rail transit (commuter rail and rapid transit) removes such trips (or major parts of them) from the road system altogether. New and increased transit services should be put in place at the same time as new development is occurring, where feasible, in order to create the "transit habit" for those moving into the new developments and forestall the buying of a second or third automobile.

Intermodal transfer points or "gateways", with appropriate parking, provide a means of intercepting auto trips before they cross into high–density urban areas, allowing easy transfer among public transport modes, and encouraging high–density development nodes which, in turn, help to support increased transit services. The provincial Ministry of Transportation has been taking initiatives in this area and in the related areas of fare integration and service co–ordination to remove barriers to the use of public transportation as it crosses from one region or municipality to another.

Transportation Management

The aim of transportation management is to achieve more efficient use of transportation facilities and services through measures such as improved traffic control, travel behaviour incentives, and traveller information systems. These include computerized urban traffic control and freeway traffic management systems, information systems telling transit passengers when the next vehicles are due to arrive, improved co–ordination of public transportation schedules, various traffic engineering measures to produce smoother traffic flow, and the design of parking rates to help encourage the use of transit and discourage peak–period auto trips while rationing the use of increasingly expensive parking stalls in subcentres and development nodes. Initiatives such as these and others are being taken by provincial and municipal transportation agencies, and more are being planned.

Travel data from the Transportation Tomorrow Survey conducted in 1986 throughout the GTA and municipal travel surveys carried out in 1979 show that the percentage of home–to–work trips (most of which occur during peak periods) carried by public transit in Metro Toronto was about 33 per cent in 1986 (up from 31 per cent in 1979); corresponding figures were about 12 per cent (up from 7 per cent) in Peel, 10 per cent (up from 9 per cent) in York, 8 per cent (up from 7 per cent) in Halton, and 7 per cent (up from 4 per cent) in Durham. Substantial improvements in transit facilities and services, and the integration of them, will be necessary to achieve similar or greater increases in transit's market share during the next 25 years. If this is not achieved, significant increases in traffic congestion can be expected throughout the GTA, particularly in the four regions surrounding Metro Toronto, the outer areas of Metro, and transportation corridors serving the central area. The transit share of trips to the central area is much higher, having risen from about 60 per cent in 1975 to about 65 per cent in 1989 for trips in the peak three hours. This reflects a combination of transit improvements (particularly in GO Transit commuter rail service) and the constraints on automobile commuting to the central area imposed by limited road capacity.

An Expanded Road Network

Even with the above three initiatives, however, expanded road networks will be required, in particular to serve new development, complete trunk networks of freeways and arterials, and reduce existing bottlenecks. Expansions to the road network are particularly relevant in the regions surrounding Metro, where sufficient rights–of–way still exist to allow them and where the growth in transportation demand is particularly strong. Improvements are also possible and necessary, however, within Metro, and road improvements are required in all areas to meet the continuing and growing requirements of goods movement, including the more stringent requirements of "just-in-time" deliveries designed to reduce inventory costs.

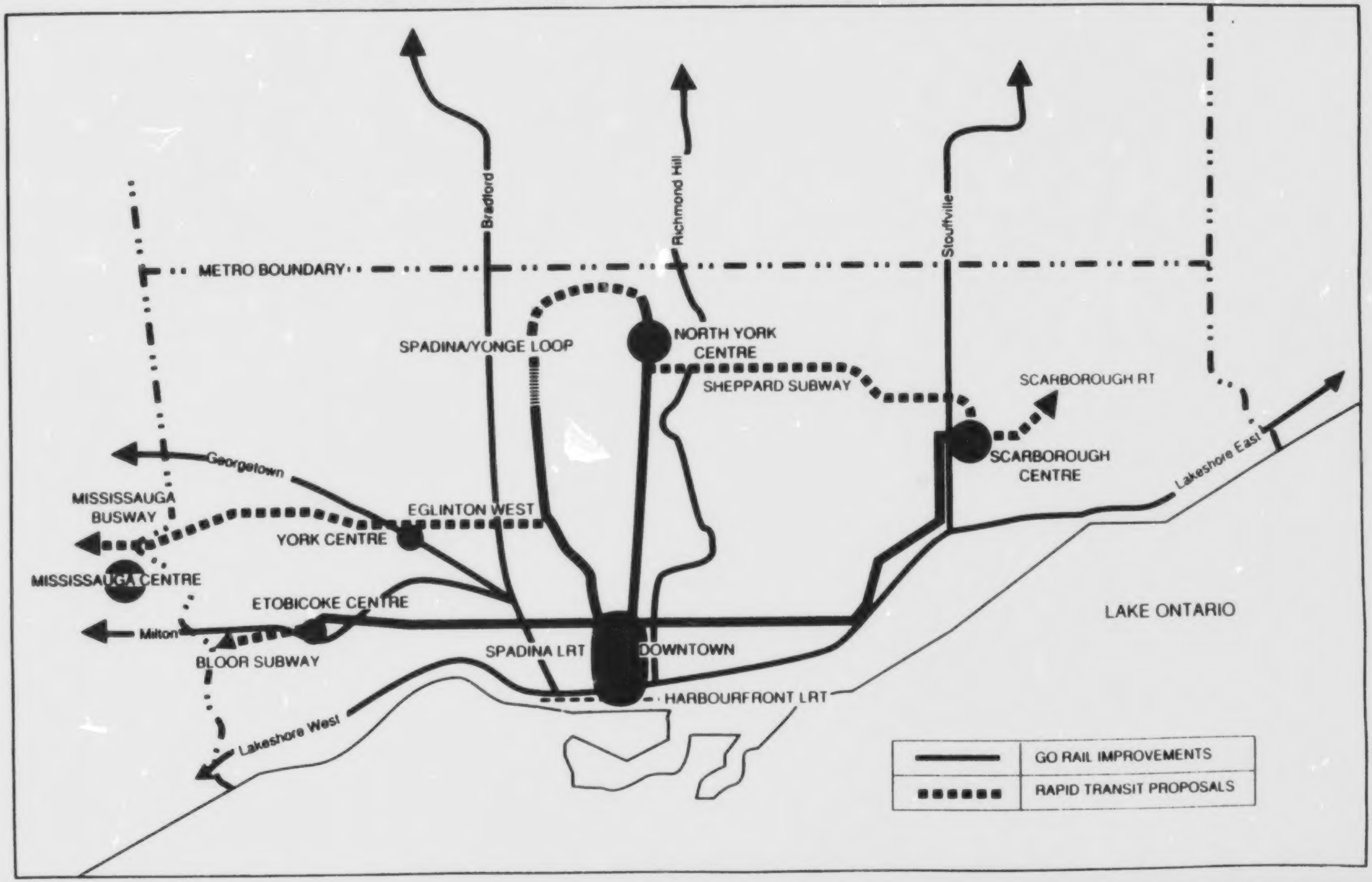
Recent Network Expansion Proposals

Exhibit 9 illustrates the commuter rail and rapid transit initiatives for the 1990s announced on 5 April 1990 by the provincial Minister of Transportation, The Honourable William Wrye. These include the following proposals.

- Improve GO Train services on all seven commuter rail lines.
- Loop the Yonge and Spadina subway lines into a single system in the Finch–Steeles area.
- Extend the Bloor–Danforth subway to Sherway Gardens.
- Extend the Scarborough rapid transit service north of Highway 401 to the Malvern area.
- Build the Spadina streetcar line to Bloor.
- Construct the Mississauga Busway from Mississauga City Centre into Metro.
- Build the Eglinton West rapid transit line from the Spadina subway west to the Busway.
- Extend the Harbourfront LRT east to Greenwood Racetrack and west to the CNE.
- Build the Sheppard subway.

The $5–billion Transportation Capital Program (TCP) also includes key highway and arterial road improvements, particularly in suburban areas, and better integration of transit services across municipal boundaries. The TCP is a massive initiative toward bringing transportation supply into better balance with existing and future demand in the GTA.

EXHIBIT 9: RAPID TRANSIT AGENDA FOR THE 90'S


Bradford
Richmond Hill
Stouffville
METRO BOUNDARY
NORTH YORK CENTRE
SPADINA/YONGE LOOP
SHEPPARD SUBWAY
SCARBOROUGH RT
SCARBOROUGH CENTRE
Lakeshore East
Georgetown
MISSISSAUGA BUSWAY
EGLINTON WEST
YORK CENTRE
MISSISSAUGA CENTRE
ETOBICOKE CENTRE
Milton
BLOOR SUBWAY
SPADINA LRT
DOWNTOWN
HARBOURFRONT LRT
LAKE ONTARIO
Lakeshore West
GO RAIL IMPROVEMENTS
RAPID TRANSIT PROPOSALS

The Menu Is Long and Dollars Are Scarce

The financial challenges of such a program were acknowledged in the 5 April announcement, which referred to possible private-sector involvement of capital funding for rapid transit facilities and made early implementation of the Sheppard subway conditional on such an initiative. This point is emphasized in Exhibit 10, which shows, in round numbers, the level of capital expenditure required to implement some of the above types of major transportation improvements. Also shown, at the bottom of the exhibit, is the extent to which transportation budgets declined as a percentage of total budgets between 1961 and 1986 at the provincial, Metro, and Peel Region levels. Recent (1988) transportation capital budgets for these jurisdictions are also shown. When it is realized that many smaller construction and rehabilitation projects must also come out of those budgets, it can be seen that hard choices must be made among the options on the "menu" and that many years will pass before all of the desired transportation improvements can be implemented, even with the announced increases in provincial funding and the possibility of direct private-sector involvement.

THE PORT FUNCTION IN THE GTA

Background

The purpose of most of Canada's major urban ports is defined primarily as the transfer of commercial or marine cargo between marine and surface modes of transportation. Canada has nearly 350 commercially oriented ports, of which 50 generate revenues of more than $100,000 each from port operations.

In those communities, the port and commercial–marine transportation are components of regional transportation systems, whether in Montreal or Vancouver's complex intermodal transportation network, or in the relative simplicity

EXHIBIT 10

LONG MENU, HIGH COSTS, AND SCARCE DOLLARS

Major Transportation Investment Candidates

- Full service on 7 GO rail lines: $500 – 800M
- Sheppard Subway: $1,500M
- Subway extensions: $200 – 400M each
- Highway 407: $1,000M
- Gardiner widening and Front St. extension: $190M
- Leslie St. extension: $110M
- Bus fleet expansion: 1,000 buses @ $0.2 M = $200M
- Metro roads 5 year capital roads program: $1,140M

Transportation Budgets
Shrinking as % of Total Budget

	1961 %	1986 %	1988 Capital Budget $
• MTO /Provincial budget	27	6	1,399M (Total MTO)
• Metro roads /Metro capital budget	37	13	46M (Metro roads)
• TTC/Metro budget			128M (TTC)
• Peel roads /Peel budget	4.5*	4.0	13.6M (Peel roads)

* 1979 figure

of a single–facility harbour such as Bayside, New Brunswick or Pointe–au–Pic, Quebec. Canada's larger ports are part of an international trade and transportation network, vital to our economy: in 1987, Canada's waterborne trade amounted to an estimated $49.2–billion, of which exports accounted for $28.1–billion and imports for $21.1–billion.

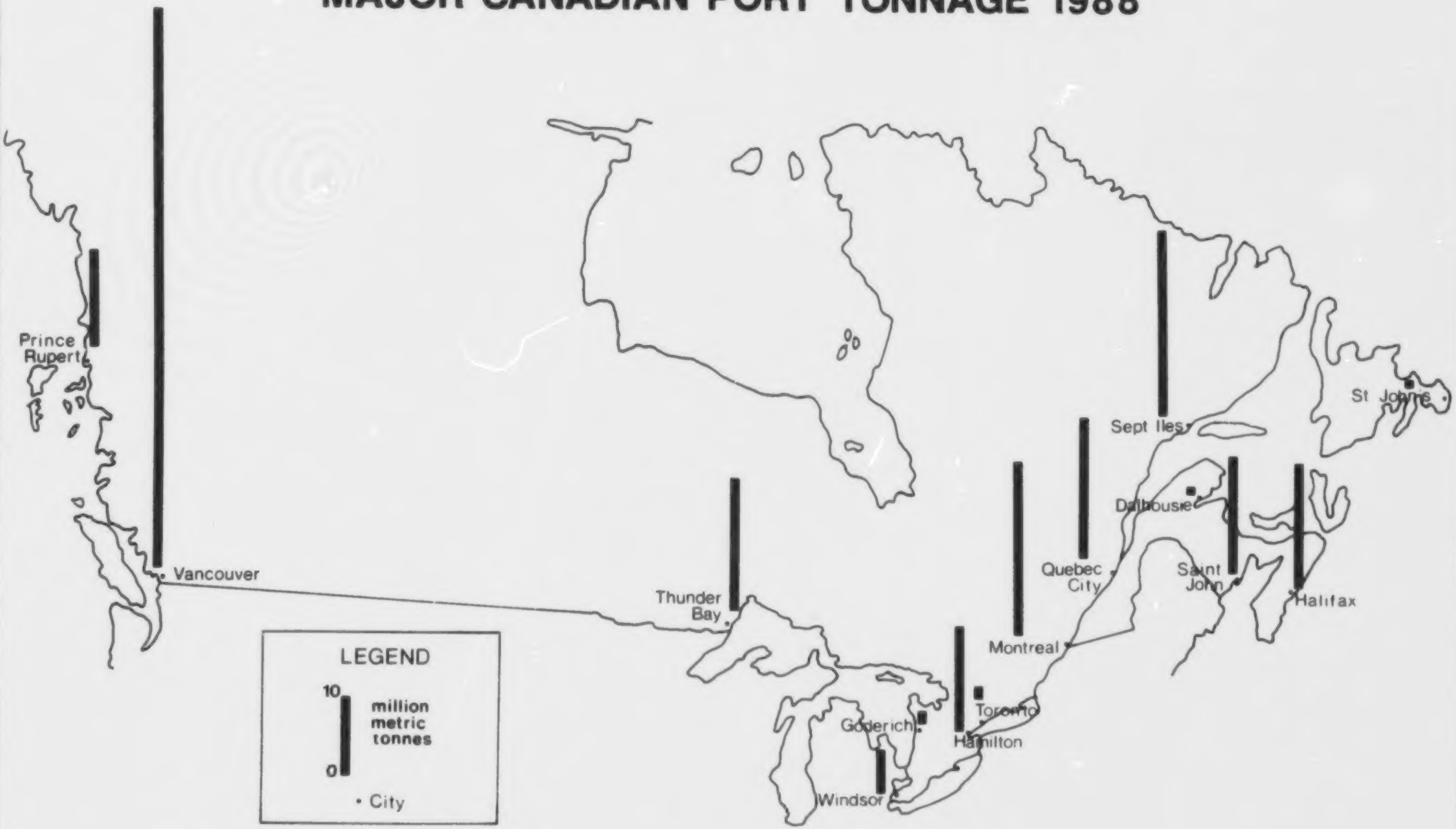
In 1988, the top 20 public ports in Canada, some of which are shown in Exhibit 11, were, in order of tonnage handled:

RANK	PORT	TONNES
1.	Vancouver, B.C.	71,316,000
2.	Sept Iles, Quebec	23,370,000
3.	Montreal, Quebec	22,239,000
4.	Quebec, Quebec	18,216,000
5.	Thunder Bay, Ontario	17,173,000
6.	Halifax, N.S.	16,236,000
7.	Saint John, N.B.	14,904,000
8.	North Fraser, B.C.	13,840,000
9.	Hamilton, Ontario	13,206,000
10.	Prince Rupert, B.C.	12,442,000
11.	Fraser River, B.C.	6,482,000
12.	Windsor, Ontario	5,771,000
13.	Chicoutimi, Quebec	4,336,000
14.	Nanaimo, B.C.	2,663,000
15.	Trois–Rivières, Quebec	1,984,000
16.	Toronto, Ontario	1,876,000
17.	Goderich, Ontario	1,777,000
18.	Port Alberni, B.C.	1,050,000
19.	St. John's, Nfld.	945,000
20.	Dalhousie, N.B.	807,000

The Lake Ontario shore, from Newcastle to Burlington, is well suited to the natural geographic development of harbours, with several rivers and creeks emptying into the lake, creating shallow bay areas ideal for sheltering small craft. Port Darlington, Oshawa, Whitby, Pickering

EXHIBIT 11

MAJOR CANADIAN PORT TONNAGE 1988


Prince Rupert
Vancouver
Thunder Bay
Windsor
Goderich
Hamilton
Toronto
Montreal
Quebec City
Sept Iles
Dalhousie
Saint John
Halifax
St John's
LEGEND
10
0
million metric tonnes
• City

(Frenchmans' Bay), Port Credit, and Oakville fit the criteria. The majority of these harbour areas are no longer commercially oriented, but have developed into pleasure and recreational centres with private and public marinas and related facilities.

Today, commercial–marine activity within the Greater Toronto Area is limited to two ports under federal jurisdiction — Oshawa, administered by the Oshawa Harbour Commission, and Toronto, administered by the Toronto Harbour Commissioners. While the Port of Hamilton, administered by the Hamilton Harbour Commissioners, is not actually in the area under discussion, it must be recognized as part of the regional transportation network. Exhibit 12 shows the ports in the GTA.

Shipping activity also takes place at several private facilities within the study area; St. Mary's Cement at Bowmanville, Ontario Hydro at the Lakeview Generating Station, St. Lawrence Cement at Clarkson, and Petro Canada at Clarkson and Oakville.

Port and Marine Traffic Overview

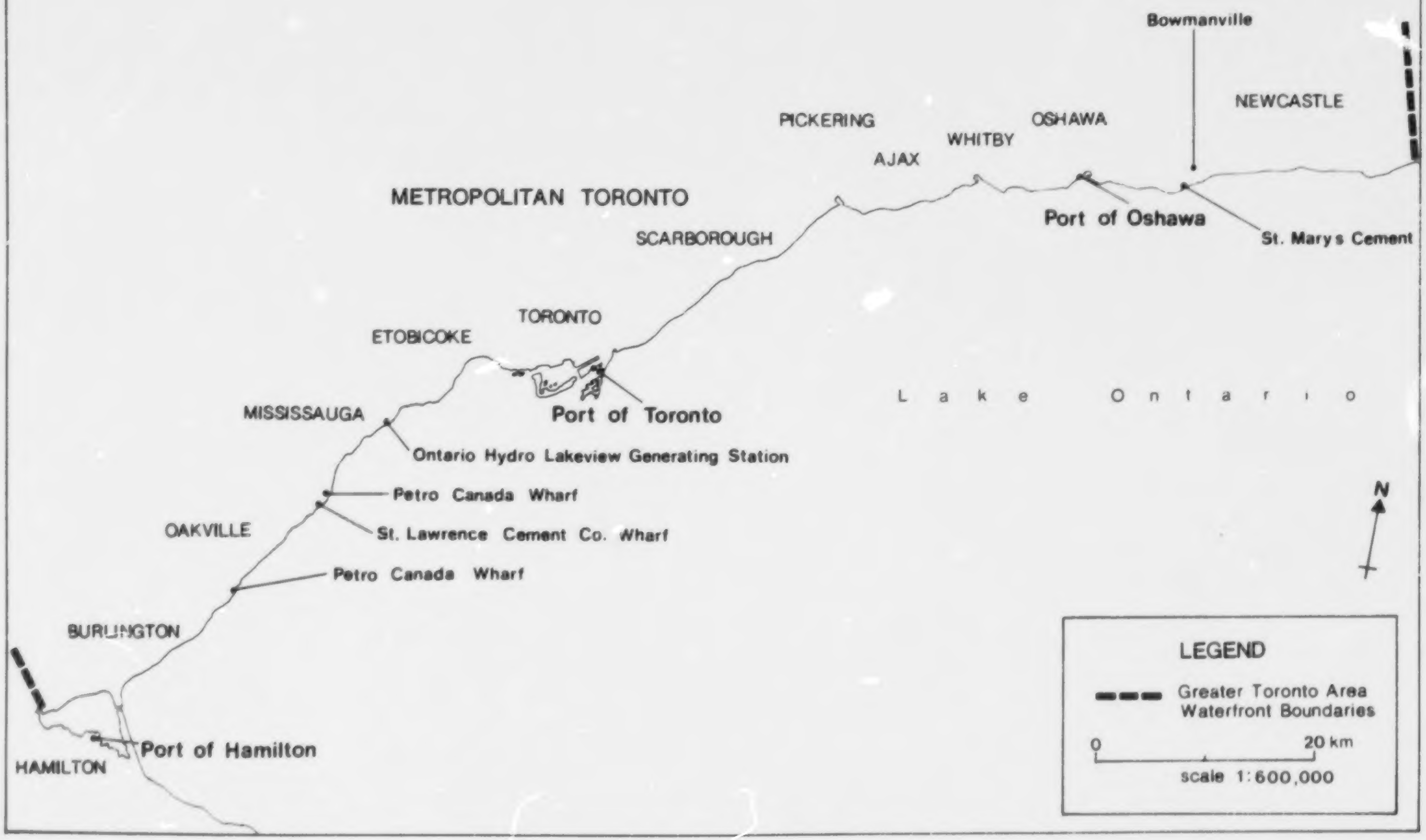
Port activity is in a continuous state of transition, and some ports flourish with changes in user requirements, technology, international and national trade, environmental concerns, financial feasibility, and competition. The following is a brief review of the harbour commissions, port administration, facilities, traffic, and users of ports in the Greater Toronto Area.

Port of Oshawa

The Port of Oshawa, 52 kilometres east of Toronto, has been administered by the Oshawa Harbour Commission since 1960. The two federally appointed and one city appointed commissioners are responsible to the federal Minister of Transport, and are charged under the *1964 Harbour Commissions Act* with administering, operating, and

EXHIBIT 12

GREATER TORONTO AREA PORTS


Bowmanville
NEWCASTLE
PICKERING
AJAX
WHITBY
OSHAWA
METROPOLITAN TORONTO
SCARBOROUGH
Port of Oshawa
St. Marys Cement
TORONTO
ETOBICOKE
Port of Toronto
Lake Ontario
MISSISSAUGA
Ontario Hydro Lakeview Generating Station
Petro Canada Wharf
OAKVILLE
St. Lawrence Cement Co. Wharf
Petro Canada Wharf
BURLINGTON
HAMILTON
Port of Hamilton
N
LEGEND
Greater Toronto Area Waterfront Boundaries
0
20 km
scale 1:600,000

developing the harbour in accordance with the federal objectives for Canadian ports. Port operations are to be financially self-sufficient.

Although the Port's origins can be traced to the early 1700s, the modern era is considered to have begun in 1930 when the Port was officially opened. While most facilities have been provided by the Government of Canada, in the late 1960s the City of Oshawa transferred 190 hectares (470 acres) of land to the Commission to be used for future port purposes. The Port currently administers approximately 200 hectares (500 acres).

Physically, the Port is built around a dredged basin, enclosed by two breakwaters extending into Lake Ontario. The berthing facilities include the East Wharf, 225 metres (738 feet) in length with a water depth of 8.2 metres (27 feet); and the South and West wharves, 430 metres (1,411 feet) with a water depth of 6.7 metres (22 feet). A 2,090–square–metre (22,500–square–foot) transit shed is located on the East Wharf. Open storage areas are adjacent to the wharf. A RoRo (roll on–roll off) ramp is incorporated in the West Wharf.

The west side of the Port has load–bearing restrictions and a draft limitation of 6.7 metres (22 feet). It is known that dredging to Seaway depth, 8.2 metres (27 feet), in this area is not practical, and so the west side is restricted to smaller, shallower draft vessels. Historically, the Port has required maintenance dredging on a regular basis.

The Harbour Commission operates a 240–berth marina in the Port basin, providing full services, including winter storage and repair, and currently administers a wetlands area known as the Second Marsh, located to the east of the actual port facilities. The area is environmentally sensitive and has been the subject of much study and controversy over the years. In 1986, a Second Marsh Management Committee outlined a marsh management program to maintain and enhance the ecosystem while using the marsh for certain passive recreational and educational purposes.

EXHIBIT 13

PORT OF OSHAWA TRAFFIC

1984–88 (tonnes)

	1984	1985	1986	1987	1988
COASTWISE					
Loaded	5,987	9,567	--	--	12,525
Unloaded	36,529	78,809	61,334	77,483	104,482
Total	42,516	88,376	61,334	77,483	117,007
INTERNATIONAL					
Container Loaded	--	--	3,254	--	--
Non–Container Loaded	3,678	2,272	11,446	18,399	7,938
Total Loaded	3,678	2,272	14,700	18,399	7,938
Container Unloaded	--	--	18	479	--
Non–Container Unloaded	156,534	233,036	224,916	169,653	61,576
Total Unloaded	156,534	233,036	224,933	170,132	61,576
Total International	160,212	235,308	239,633	188,531	69,515
TOTAL PORT	202,728	323,684	300,967	266,014	186,522

SOURCE: Statistics Canada

In 1984, the Oshawa Harbour Development Plan, prepared by a task force that included members from all levels of government, was submitted to the Harbour Commission following a thorough public consultation process; it recommended a phased expansion plan, generally southward and eastward to accommodate port traffic as required, to cost an estimated $38 million. While the plan is still conceptually valid, the traffic needed to justify expansion has not developed.

In the period from 1984 to 1988, as shown in Exhibit 13, total port traffic ranged from a low of 187,000 tonnes (1988) to a high of 324,000 tonnes (1985). Major port users include General Chemical (calcium chloride), Kalium Chemicals (potash), McAsphalt Ltd. (liquid asphalt and gasoline), Durham Stevedoring and Warehousing (steel and project cargo), and Olco (petroleum products). In the past, the Port handled substantial sugar tonnage for the Lantic Sugar refinery; however, the refinery closed in 1988. The Port also handled coal traffic, which has relocated to Bowmanville.

Port of Toronto

In earlier geological times a glacial lake, Lake Iroquois, covered what is now known as Southern Ontario, and the lake plain that had been cut in previously deposited clay and till was partially covered with sand deposits. The retreating glacier created the Don and Humber valleys, leaving behind sand and gravel deposits, and exposing the clay deposits that were eventually used to build the city itself. The harbour area (which originally included the mouths of the Don and Humber rivers) developed as a phenomenon of the Lake Ontario shoreline and a product of its waves and currents.

While the Port of Toronto goes back to the 1800s, its modern history begins with the federal *Toronto Harbour Commissioners Act* of 1911, which gave the Commissioners a wide mandate to manage the Port, provide facilities for shipping, and develop the waterfront in the public interest. The THC is unique among the nine harbour commissions in Canada in that it is the only one on which the majority of the commissioners is appointed by the municipality rather than the federal government. There are three municipal appointees, all currently City councillors, and there are two federal appointees, one of whom is the nominee of the Board of Trade of Metropolitan Toronto.

While port legislation was changed substantially in 1983, with the passage of the *Canada Ports Corporation Act*, the 1911 *Act* was unaltered and, in its current form, does not reflect the Government of Canada's objectives, as set out in its national ports policy.

As the result of lakefill over the years, the nature and shape of the Toronto port waterfront has changed; as with many long established ports, the Port of Toronto reflects a mixture of public and private land ownership and marine terminal operation. The THC operates its own terminals — marine terminals 35, 51, 52, and the Container Distribution Centre — as public terminals to handle a wide variety of commodities from various sources. It also leases its property to a range of customers who, in turn, are responsible for their own operations, as for example the bulk salt operations of the Canadian Salt Company, the Iroquois Salt Company, and Domtar Sifto along the Ship Channel.

Private companies also own property within the harbour limits, on which they operate their own marine–related businesses without involvement of the Port administration. Redpath Sugar, in the East Bayfront area, is perhaps the prime example of this type of operation.

Marine Terminal 51 (MT 51) is the primary general cargo terminal in the Port, providing 760 metres (2,500 feet) of berthing space with a water depth of 7.9–8.2 metres (26–27 feet). It also has 18,600 square metres (200,000 square feet) of shedded storage space. Imported steel products, originating in various ports of the world and brought in by as many as 50 importers, are the major source of general cargo.

MT 51 is physically connected to Marine Terminal 52 (MT 52), the Container Distribution Centre, approximately 28 hectares (70 acres) in size, built in 1969 to handle marine containers. The terminal includes Warehouse 52, designed for container handling, stuffing, and destuffing, and includes refrigerated storage facilities. The terminal incorporates a RoRo facility. Although designed for containers being loaded onto or offloaded from vessels, the majority of the container operations are land–based: commodities are warehoused and stored, containers stuffed and destuffed. Most operations are centred around stuffing land–based containers, which are forwarded to Montreal by rail, to be shipped to export markets.

Marine Terminal 35 (MT 35) was the main general cargo terminal until 1974. The terminal covers 8 hectares (20 acres), has shedded storage space of 12,800 square metres (138,000 square feet) and provides 960 metres (3,150 feet) of berthing space with a water depth of 7.6–7.9 metres (25–26 feet). The 300–tonne, heavy–lift Atlas crane is located on MT 35 and is used primarily for project cargoes.

CP Rail operates a nine–hectare (22–acre) land–based container distribution yard, in co–operation with Morflot, the Soviet steamship company.

The Toronto Harbour Commissioners also own MT 28 and MT 29, the Queen Elizabeth Docks, built in the 1950s to accommodate an expected increase in traffic related to the opening of the St. Lawrence Seaway. The facility has 790 metres (2,600 feet) of berthing space; two storage sheds of almost the same size; 9,500 square metres (102,000 square feet); and open storage areas of approximately 52,000 square metres (560,000 square feet). They currently do not serve a marine function and are utilized by a sports club, Canpar parcel distribution, and Voyageur. The Toronto Harbour Commissioners also operate the marine yard, located on the south side of the Keating Channel, as the centre for maintenance, repair, and marine operations.

Cement has been consistently moved in the Port: the Metro Toronto area uses two million tonnes of Ontario cement annually, approximately half the total used in the province. The use of cement is related directly to the construction industry and rate of growth and development in the Toronto area and has ranged in recent years from 333,000 tonnes in 1982 to a high of 709,000 tonnes in 1980. Lake Ontario Cement operates from leased property adjacent to MT 35, distributing the product from its Picton, Ontario plant to local customers and ready–mix operations. Canada Cement Lafarge operates on privately owned land at Polson and Cherry streets.

Highway salt is offloaded in the Port by three companies — Canadian Salt Company Limited, Iroquois Salt Company Limited, and Domtar Sifto. The salt, offloaded on leased land on the Ship Channel, originates in Windsor, Goderich, and the United States. Volume, which depends on winter weather and on the expanding urban road network, has ranged from 158,000 tonnes in 1983 to 456,000 tonnes in 1987. Generally the salt is used within a radius of the Port; as much as 80 per cent is used in the Metro Toronto area.

The Redpath Sugar plant, located on a six–hectare (15–acre) lot, 1.6 hectares (4 acres) of which are leased from the Toronto Harbour Commissioners for bulk storage of sugar, imports raw sugar from world markets, averaging 300,000 tonnes per annum. Grain traffic in the Port includes soybeans and malt, destined for both the Victory Soya Mill and Canada Malting. Waterborne tonnage has varied substantially, from close to 700,000 tonnes in 1975 to 176,000 tonnes in 1987. The decrease is because of the increased use of road and rail shipping.

Six companies handle approximately 200,000 tonnes of liquid bulk commodities: they include Roy L. Fuels, gasoline and fuel oil; McAsphalt Industries Ltd., liquid asphalt;

Rothsay, Darling, liquid tallow, animal by-products; Hiram Walker, Gooderham and Worts, molasses and rum. Liquiterminals Ltd. handles products for the latter four companies. Petroleum products were once a major commodity moving through the Port, with well over one million tonnes handled in 1970. This tonnage dropped to 7,000 tonnes in 1985 and disappeared in 1986. Roy L. Fuels is now the only company handling petroleum products. Changing technologies, such as pipelines, and changing distribution patterns and policies account for the decline. Coal, once a significant port tonnage, accounted for 1.5-million tonnes in 1970, and disappeared altogether in 1983 with the closure of the Hearn Generating Station.

Marine-related container traffic at MT 51 reached a high of 12,000 TEUs (total equivalent units) in 1972 and, in general, has declined since then to a low of 1,515 TEUs in 1988. Total port traffic has moved generally downward over the last 20 years: THC data indicate that total port tonnage declined from 5.6-million tonnes in 1970 to two million tonnes in 1982. Since then, the figure has remained slightly above or slightly below the two-million-tonne level. Recent tonnages in the Port of Toronto are shown in Exhibit 14.

The Royal Commission on the Future of the Toronto Waterfront's first interim report was released in August 1989. The following month, the Province endorsed the report and designated the Port Industrial Lands and East Bayfront an area of Declared Provincial Interest under the *Ontario Planning Act*. This Declaration of Provincial Interest allows the Province to prevent any major development in an area until it can determine what would be appropriate for people and for the environment. The area is currently the subject of an environmental audit being co-ordinated by the Royal Commission.

EXHIBIT 14

PORT OF TORONTO TRAFFIC

1983–88 (tonnes)

	1983	1984	1985	1986	1987	1988
COASTWISE						
Loaded	259,361	21,359	56,439	2,736	508	18,040
Unloaded	764,671	974,061	769,797	981,947	997,781	875,975
Total	1,024,032	995,420	826,236	984,683	998,289	894,015
INTERNATIONAL						
Container Loaded	4,857	2,532	454	1,858	5,271	4,827
Non–Container Loaded	92,603	107,267	64,096	89,215	66,382	85,389
Total Loaded	97,459	109,799	64,550	91,072	71,652	90,216
Container Unloaded	19,949	25,335	32,507	15,693	13,204	9,613
Non–Container Unloaded	537,277	766,615	793,201	768,832	802,858	633,859
Total Unloaded	557,226	791,950	825,707	784,525	816,062	643,471
Total International	654,685	901,749	890,257	875,598	877,714	733,687
TOTAL PORT	1,678,717	1,897,169	1,716,493	1,860,281	1,886,003	1,627,702

SOURCE: Statistics Canada

Port of Hamilton

Marine transportation began in the Port of Hamilton in the 1800s, when a canal was cut through the beach strip to accommodate commercial shipping; the first intermodal interfaces were developed when the railways reached the Port; the steel industry came into being along the waterfront when electric power became available.

In 1912, the federal government established the Hamilton Harbour Commissioners through an act of Parliament. Two commissioners are appointed by the federal government and one by the City of Hamilton; they are required to administer and supervise shipping activities in the Port and to develop waterfront properties for shipping, navigation, and related purposes.

The Port is a blend of privately owned and operated terminals and those operated by the Hamilton Harbour Commissioners, which also lease terminals to the private sector. Stelco and Dofasco are symbols of "smokestack Hamilton", with plants that cover 690 hectares (1,700 acres) on the central waterfront, and are responsible for the majority of the port tonnage of iron ore, coal, and finished steel products; they are major regional employers.

The Port provides eight major shipping terminals capable of handling general cargo, liquid, and dry bulk. The Commissioners operate two overseas shipping terminals, Centennial Terminal on Pier 8 and the Wellington Street Terminal. They provide 15 hectares (37 acres) of terminal space, 1,400 metres (4,600 feet) of berthing space, and 36,000 square metres (387,500 square feet) of warehouse space and handle a variety of cargoes — from machinery to containers. The Port also handles considerable bulk traffic, both liquid and dry, as well as commodities used by the steel industry. Seaway Terminals handles potash, phosphate, and urea; United Co–operatives handles and stores potash; and Lakeshore Sand distributes sand for foundry use. Other bulk

EXHIBIT 15

PORT OF HAMILTON TRAFFIC

1984–88 (tonnes)

	1984	1985	1986	1987	1988
COASTWISE					
Loaded	113,185	167,949	97,685	220,800	374,210
Unloaded	5,515,110	4,447,294	4,594,927	4,699,237	5,585,489
Total	5,628,296	4,615,243	4,692,612	4,920,037	5,959,699
INTERNATIONAL					
Container Loaded	1,295	8,077	1,092	51	124
Non–Container Loaded	356,482	373,707	543,568	555,309	648,573
Total Loaded	357,777	381,784	544,660	555,360	648,697
Container Unloaded	22	30	16	58	497
Non–Container Unloaded	6,387,095	5,308,838	5,175,505	5,459,308	6,324,302
Total Unloaded	6,387,117	5,308,869	5,175,520	5,459,365	6,324,799
Total International	6,744,894	5,690,653	5,720,181	6,014,725	6,973,496
TOTAL PORT	12,373,190	10,305,896	10,412,793	10,934,762	12,933,195

SOURCE: Statistics Canada

commodities include cement, manganese, chrome ores, slag, aggregate, salt, fluorspar, and gypsum. Liquid bulk includes styrene, molasses, asphalt, and petroleum products handled by companies such as Montank Transit and Canada West Indies Molasses.

The Hamilton Harbour Commissioners are also developing the East Port Marine and Industrial Park along the Queen Elizabeth Way, adjacent to Lake Ontario. Opened in 1987, the site offers berthing space and back–up land for water–dependent uses; Agrico Canada has established a fertilizer terminal in the park.

Between 1984 and 1988 the Port consistently handled more than 10 million tonnes of goods annually with a high of 12.9–million tonnes in 1988; in that period, foreign traffic consistently represented 55 per cent of traffic. The Port of Hamilton is a major contributor to, as well as a beneficiary of, the St. Lawrence Seaway system. Traffic in the Port between 1984 and 1988 is shown in Exhibit 15.

While it is primarily a traditional working port, the Port of Hamilton also has important recreational facilities, such as the Marine Dock, which provides 230 fully serviced recreational boating slips, 250 moorings, repairs, service, and storage facilities. It also operates the Hamilton Harbour Commissioners Sailing School, which teaches students sailing basics and boating safety.

The following are brief descriptions of the privately owned and operated marine terminal facilities in the Greater Toronto Area.

Bowmanville

Bowmanville, located ten kilometres east of Oshawa, is the home of St. Mary's Cement, which produces cement, pre–cast concrete, concrete blocks, and ready–mix cement. The plant receives raw product via its private wharf facility, which is operated for the company by the Rochester and Pittsburgh Coal Company. The wharf forms the end of a landfill area that extends about 670 metres (2,200 feet) from the shoreline.

The wharf, with a berthing face of 256 metres (840 feet) and a water depth of 8.8–9.1 metres (29–30 feet), consists of five mooring dolphins, one central breasting dolphin flanked on either side by two additional dolphins; it can accommodate 222–metre (730–foot) self–unloading vessels. The adjacent storage area has a capacity of some 500,000 tonnes. Materials can be loaded at the facility if necessary.

The commodities handled include salt, coal, coke, slag, and gypsum. Tonnage of about 300,000 tonnes per annum involves coal for General Motors and salt for the Canadian Salt Company and the Iroquois Salt Company.

Based on forecasts of increased demand for cement in both Canada and the United States, St. Mary's is in the process of a $160–million expansion of the Bowmanville plant, which will increase capacity from 2,000 tonnes to 5,000 tonnes per day; marine terminal facilities will also be expanded. A second terminal will be built west of the existing structure, doubling current capacity. The company is seeking required approval to acquire waterlots and to lakefill.

Lakeview

The Ontario Hydro Lakeview Generating Station, located east of Port Credit, has its own coal–receiving facilities consisting of a dock with a water depth of eight metres (27 feet) and parallel entrance breakwaters extending over 300 metres (980 feet) into Lake Ontario. Coal is discharged through a hopper/conveyor system to an open storage area with a capacity of 2.3–million tonnes. It is shipped during the Seaway season, from Astabula, Ohio, via Lake Erie ports. The number of vessel calls varies from 45 to 80 each year, depending on energy requirements; the vessels have an average capacity of 25,000 tonnes.

Clarkson

There are two private marine terminals located in Clarkson (Mississauga), one owned by Petro Canada and the other belonging to the St. Lawrence Cement Company. The first is a concrete structure 226 metres (740 feet) long, connected to the shore by a 355–metre (1,165–foot) causeway; it has two outer berths of 198 metres (650 feet) and 114 metres (375 feet) as well as a 91–metre (300–foot) inner berth. The Petro Canada refinery has been in operation since 1957 and ships lube oils primarily. Vessels call during the Seaway season about 35 to 50 times. These "lakers" are capable of carrying an average of 50,000 barrels of oil per vessel.

The St. Lawrence Cement wharf facility is located 1.6 kilometres west of the Petro Canada terminal. A causeway 366 metres (1,200 feet) long extends to a wharf 355 metres (1,165 feet) long. A reversible conveyor belt system transports commodities to and from the plant, which is located on the north side of Lakeshore Boulevard. The shipping season is essentially that of the Seaway.

Commodities unloaded include two million tonnes of crushed limestone from Ogden Point (Colborne) as well as coal. Self–unloading vessels with a capacity of 17,000 tonnes are used continuously, with a 36–hour turn–around time. Commodities shipped by the company, using its own cement barges, to U.S. locations on the Great Lakes, include finished cement and semi–finished cement or clinker. The annual marine tonnage is between 400,000 and 700,000 tonnes. Westrock, another private company, also uses the facility to unload gypsum for its own plant.

Oakville

The Petro Canada refinery, which has been in operation for 25 years, leases the former Shell Oil terminal, a wharf 690 metres (2,265 feet) in length, in Oakville, shipping and receiving a full range of products in bulk form. It handles 55 to 65 lakers annually, each with an approximate capacity of 40,000 barrels.

GTA Ports and the Great Lakes – St. Lawrence Seaway System

Commercial port activity in the GTA comprises mature, longstanding operations that respond to national and local trade and transportation requirements that also reflect the state of marine transportation along the Great Lakes–St. Lawrence Seaway system. The system's physical characteristics impose restrictions on the ports, whether they serve marine traffic originating or destined overseas or handle only Great Lakes traffic.

The St. Lawrence Seaway, which opened in 1959, has developed into a bulk transportation route that serves both offshore foreign markets and the industrial heartland of North America. The total number of cargo tonnes handled grew from 30 million in 1960 to a high of 73–74 million between 1977 and 1979. The system handled 51 million tonnes of commodities in 1987 and 53 million in 1988. In 1988, traffic included, on the Montreal–Lake Ontario section, 15.5–million tonnes of agricultural products, 16.2–million tonnes of mine products, and 8.7–million tonnes of processed products.

Among the principal commodities: wheat, corn, soybeans, iron ore, coal and coke, salt, iron and steel, fuel oil and petroleum products, and chemicals. No one port in the GTA handles all the major commodities, although the Port of Hamilton has perhaps the broadest range of cargoes. The majority of Seaway traffic, carrying bulk commodities upbound and downbound, bypasses both the Toronto and Oshawa ports.

The Seaway imposes physical restrictions on port activity. The shipping season generally opens in late March or early April and closes in mid to late December — an annual average, in the past decade, of 270 navigation days. Industries and services stockpile commodities such as coal, salt, and sugar to ensure continuous operations, which means that substantial acreage has to be set aside for storage. An alternative is to rely on land-based transportation systems, such as rail, to meet winter requirements. Generally, marine terminal operations in the GTA incorporate substantial open storage areas.

The size of vessels using the Seaway is restricted by the depth of the Seaway, as well as the size and capacity of its locks. Although its depth is usually described as 8.2 metres (27 feet), vessels usually draw only 7.9 metres (26 feet). The Montreal–Lake Ontario section can handle vessels up to 222 metres (730 feet) long while the Upper Lakes can accommodate vessels up to 304 metres (1,000 feet) in length.

The winter closure, restricted vessel size, and the time required to go through the system are contributing factors to the limited container traffic on the Seaway. Consumer–oriented containerized general cargo requires continuous market access, which is not possible in a system that shuts down for three–and–a–half months each year. Modern container vessels capable of carrying 3,000 containers are simply too large and too expensive to operate in the Seaway and must load and unload at limited centres including Vancouver, Montreal, and Halifax. While the ports of Hamilton and Toronto have the capability to handle containers, the volume of traffic is marginal in the overall context of the Canadian and North American container market.

The Canadian Shipowners Association (CSA) represents 14 member companies operating a domestic fleet of 122 vessels, a decrease of nearly one–third in the past decade. Reductions have been even greater in the number of bulkers, tankers, and general cargo vessels; the number of self–unloaders has remained stable. While there are other vessels operating on the Great Lakes and there are other reasons for shifts in the fleet profile, the changes reflect the nature of current port activity: self–unloaders are preferred for bulk operations and the traditional general cargo vessels are becoming less important overall.

Figures for 1988 show changes in the cargoes handled by CSA vessels in that year as compared to the years between 1983 and 1987: there were nearly a third fewer tonnes of general cargo; substantial increases in coal and iron ore; a marginal increase in cement; a decrease in grain, because of drought and market conditions; relatively constant levels of salt.

The private marine terminals, unlike the ports in the GTA (including Hamilton), do not necessarily reflect changes to shipping in the Great Lakes – Seaway system: they are not, by their nature, part of a national transportation system, but serve a specific, dedicated purpose related to efficient industrial operations. There is currently no network relationship among the private ports, or between them and the publicly administered ports. Nonetheless, competitive relationships may develop.

The Transportation Function of the Port of Toronto

By definition, the basic port is a place at which goods are loaded and unloaded, where short–term storage of commodities awaiting distribution is available, whether outbound or loaded, inbound or unloaded. Ports are meant to ensure efficient movement of goods, a high level of productivity, and low–cost service to customers. As transfer points, ports are a node in the overall transportation network. It is useful to consider those factors when evaluating the Port of Toronto's transportation functions.

Marine Terminal Operations

Between 1982 and 1988, commodities being unloaded accounted, on average, for 90 per cent of the Port's total annual traffic — slightly more tonnage originating domestically than from foreign sources. Domestic cargoes include cement, sand, stone, salt, and grain. There have been no movements of petroleum products since 1985 or of coal since 1983. The major bulk commodity from international sources continues to be sugar. Liquid bulk traffic unloaded at the Port includes small volumes of petroleum products, liquid asphalt, and molasses. Liquid tallow is the only liquid bulk loaded for export.

Dry bulk unloading and general cargo handling are the two primary types of terminal operations, and either serve waterfront industries or are part of the storage and distribution process.

Bulk Terminal Operations

Several major waterfront industries depend on their adjacent marine terminals to provide marine access for raw materials. Redpath Sugar offloads sugar from various international markets; Lake Ontario Cement and Canada Cement Lafarge bring in cement from eastern Ontario; Hiram Walker–Gooderham and Worts imports molasses for its distillery and Victory Soya brings in soybeans.

Each of these companies requires direct waterfront access, and marine terminals, in order to take advantage of low–cost marine transportation. Some are situated on land they own, while others lease property from the Toronto Harbour Commissioners, which acts only as landlord and not as operator. The companies meet their own stevedoring and other personnel needs themselves or by using stevedoring companies.

Almost all port industries ship their final products to local or regional markets by truck or by rail. Relatively modest tonnages are shipped by vessel. Other bulk operations involve storage and distribution of various products, generally to the Greater Toronto market, with little value added. (Road salt, for example, is delivered and stockpiled during the shipping season, then used on local roads.) Marine transportation and waterfront access offer the companies operational efficiencies and financial viability in dealing with low–value goods (such as salt) that are price–sensitive and vulnerable to fluctuating transportation costs.

The Port's main use, both to those serving local industries and those providing storage and distribution, is to provide water access and property for lease. The Toronto Harbour Commissioners are the landlord for the majority of these industries and services.

General Cargo Operations

There are general cargo operations at marine terminals 35, 51, 52, and the Container Distribution Centre (CDC) operated by the Toronto Harbour Commissioners. General cargo commodities include some 40 items, ranging from televisions to machine parts, from clothing to furniture, that are packaged in small lots or in containers. Uncontainerized general cargo is usually stored on site in a marine terminal warehouse. While total tonnage varies from year to year, it is usually about 300,000 tonnes annually, while the THC's general cargo terminals have an estimated cargo–handling capacity of 600,000 to 800,000 tonnes per year.

While marine terminals 27, 28, and 29 were built in the 1950s, in expectation of Seaway–generated trade, they have not been in commercial marine use since the early 1970s. Marine Terminal 27 was sold to private interests and 28 is a sports club, while Canpar parcel distribution service and Voyageur bus lines use Marine Terminal 29.

General cargo tonnage at MT 51 ranges from 200,000 to 240,000 tonnes, mainly from steel plate, rods, and structural shapes. But the volume of steel varies, depending on market conditions, which are difficult to forecast: some European companies trade regularly with others in the spot market. Storage is usually free for between 10 and 30 days. Storage fees (demurrage) range from $1.00 to $1.50 per tonne, providing inexpensive long–term storage for products.

The Port is also involved in both land–based and marine–related container operations. CP Rail uses a nine–hectare (23–acre) site adjacent to MT 35 to distribute Morflot containers for the Soviet carrier operating out of Montreal. The CDC is used for the stuffing, destuffing, warehousing, and distributing of land–based containers, which, from 1985 to 1988, ranged in number from 10,617 to 41,062. These operations are not related to marine transportation in the Port of Toronto, but simply utilize available space and rail access.

The limited number of marine–based containers handled by the Port, 1,515 TEUs in 1988, represent only a small percentage of the total and are negligible as a proportion of the current Canadian market of 1.4–million TEUs. Given current transportation economics and technology, it is unlikely that the Port, given its inland location on the Great Lakes, will be a major player in the container trade; however, the Port recently opened a $2.2–million repair depot designed to service container–handling equipment.

Project Cargo

The Port has a good reputation for handling "project" cargoes —specialty one–time shipments which are usually large, heavy, and awkward to load and transport, and which may include such items as earth–moving equipment, locomotives, streetcars or turbines. The frequency of such shipments is not easy to predict.

Intermodal Access

Road and rail connections (intermodal access) to marine terminals are a key to efficient operations in a major urban working port, where access to marine terminals can become congested, and it is often difficult or impossible to develop added road or rail access.

The Port of Toronto is well served by road and by direct rail access that connects with both CN and CP national networks. In fact, compared to the current level of marine traffic, there is rail overcapacity in the Port area, particularly at a time when most tonnage consists of dry bulk that is unloaded and distributed by truck.

The Port area is also well served internally by roads that link terminals with Lakeshore Boulevard East at three main intersections. Traffic counts taken by Metro's Department of Roads and Traffic at various times in 1989 show that eight–hour traffic movements through these three intersections totalled 15,387 at the Lakeshore and Don Roadway; 13,984 at the Lakeshore and Cherry Street East; and 21,064 at the Lakeshore and Leslie Street. Most vehicular traffic is generated by non–port–related activities, such as garbage consolidation at a nearby station. Some traffic, such as salt distribution, is seasonal. Vehicular movements to and from the Port area must contend with the city's traffic congestion.

Intermodal access, both within the Port area and in relation to its transportation function, is more than adequate, although access from Unwin Avenue to the salt berths on the south side of the Ship Channel could be improved.

Water Dependency and the Working Port

Urban waterfronts are a mixture of land uses, some of which are water–dependent, some merely water–related, and some having no functional links to the water or the waterfront. Water–dependent uses are those that cannot exist except on the waterfront. They require direct water access for their normal commercial operations. Included in this category, for example, would be cargo handling terminals, ferry slips, ship repair facilities, and marinas.

Water–related uses are those that may benefit from a waterfront location but that could also function if they were not located directly on the waterfront. These activities and uses can include hotels, restaurants, processing plants, storage, and warehousing.

A third category of waterfront land uses includes those that are neither related to the waterfront nor dependent on the water. Included in this category, for example, would be uses such as commercial office buildings, private residences, and land–based transportation functions.

Land use in the Port area can also be classified according to the degree to which it makes use of the traditional port functions of moving cargo. In these terms, non–port–related activities include, among others, the Knob Hill food retail outlet, George Brown College's truck–driving school, and the K–9 Division of the Toronto Metropolitan Police.

A survey undertaken to identify water–dependent, water–related and non–related activities in the Port Industrial Area catalogued 237 Port sites according to use and activity. (In multi–tenanted buildings, the activity of each tenant was classified separately.) Of the total number, 33 were considered port–related; 18 water–dependent; and 15 water–related. The individual water dependent activities or uses include the following:

Canada Cement Lafarge – cement storage, distribution
Lake Ontario Cement – cement storage, distribution
THC Marine Terminal 35 – general cargo
THC Marine Terminal 51 – general cargo
THC Harbour Master Dock – berths
Rothsay Concentrates Co. – tallow storage, trans–shipment
Darling and Co. – animal waste trans–shipment
Domtar Sifto Division – salt storage, distribution
Iroquois Salt Products – salt storage, distribution
Canadian Salt Company – salt storage, distribution
Liquiterminals – bulk storage, distribution
Roy L. Canadian Fuels – petroleum storage, distribution
McAsphalt Industries – asphalt storage, trans–shipment

McCord and Co.	–	aggregate storage, distribution
Miller Paving	–	aggregate storage, distribution
Gooderham & Worts	–	molasses trans–shipment
Redpath Industries	–	raw sugar trans–shipment
Victory Soya Mills	–	soybean trans–shipment

It has been estimated that these activities or uses currently occupy approximately 52 hectares (128 acres), essentially along the Ship Channel, in the area of the THC terminals and in the East Bayfront sector. This represents approximately 9 per cent of the 600–hectare (1,482–acre) area of Declared Provincial Interest. These water–dependent activities represent approximately 14 per cent of the 370–hectare (914–acre) Port Industrial District, which excludes the East Bayfront sector (Redpath Sugar, Gooderham and Worts, and Victory Soya Mills).

The water–related activities and services include the following:

Seaway Terminals	–	stevedoring
SGS Supervision Services	–	cargo supervision services
Empire Stevedores	–	stevedoring
ILA Local 1842	–	Longshoremens' union
Suncor (2 locations)	–	oil company
Texaco Canada	–	oil company
BA Home Comfort	–	oil company
Power Tank Lines	–	liquid bulk transportation
Barnes and David Steel	–	steel products warehousing
THC Marine Yard	–	THC Works Division
THC Rail Sorting Yard	–	rail transportation
THC Marine Terminal 52	–	container distribution
Toronto Port Security	–	security
Canada Malting Co.	–	malt storage, trans–shipment

Preliminary estimates indicate that these activities and uses occupy approximately 42 hectares (104 acres) in the THC terminals area, East Bayfront, the Keating Channel, and along the Ship Channel. This represents approximately 7 per cent of the area of Declared Provincial Interest and 11 per cent of the Port Industrial District.

Some water–dependent or water–related uses are changing: Canada Malting is becoming more dependent on receiving malt from trucks than from vessels, and less dependent on marine access. The THC Container Distribution Centre traffic is far more land–based than marine–related. The Texaco storage and distribution facility is served primarily by pipeline, although three berths totalling 457 metres (1,500 feet) in length are still available to the company.

The THC is the primary landowner in the area of port–related activity and owns approximately 89 per cent of the land associated with water–dependent activities. Only Gooderham and Worts, and Redpath Industries own the land on which they operate. Redpath Sugar leases a bulk storage area from the THC. The THC is also the primary landowner of water–related facilities, having approximately 64 per cent of such land under its control. Canada Malting, Imperial Oil, Texaco Canada, Baines, and David Steel are the only private water–related companies that own land here.

If the Toronto Harbour Commissioners were to enter into an agreement with a terminal operator to operate these facilities, the Commissioners could concentrate solely on administering the terminals as their landlord.

Most major ports in Canada enter into terminal operator agreements with the private sector for port–owned terminals: a terminal operator, such as a stevedoring company, agrees to manage the terminal for a specific period, providing the port with a guaranteed basic revenue, as well as a specific level of service, and usually agrees to participate in the port's strategic planning, marketing, and traffic development programs.

Because the operator usually provides the required cargo-handling equipment, the term of the agreement is generally long enough to permit a return on capital investment.

Under this type of administration, the port authority becomes less involved with the day-to-day operation of the terminals, but must ensure that such essentials as strategic planning, market research, port promotion, and pricing reflect the needs of the terminal operator so that the overall competitive position of the port is not weakened. The terminal operator and the port become partners in all aspects of development and promotion, utilizing the strengths of each organization.

Operating agreements are generally financially beneficial to the port authority, which has a degree of protection from market and traffic fluctuations. Furthermore, an operating agreement may permit the port to reassess its requirements and reassign priorities.

The transportation function of the Port of Toronto is fourfold.

- First, it serves as a transfer, storage, and distribution centre for inbound bulk commodities (cement, sugar, salt, aggregates, soybeans) required by several waterfront industries serving regional and local market requirements. These commodities, most of which are relatively low-value, benefit from the availability of low-cost water transportation and open storage in the Port, as well as direct market access.
- Second, the Port provides inexpensive storage and distribution facilities for steel imports. This traffic is attracted to the Port not only by the potential of the Toronto market, but also by the relatively low demurrage charges, which enable the importer to store products for long periods at a low cost.
- Third, the Port provides a container distribution service for land-based containers transferred to and from the Port of Montreal by rail. This service is not a

marine–based operation. The Port does have the capability of handling marine–based containers; however, this traffic has not developed and likely will not develop significantly.

- Fourth, the Port provides terminal capacity to handle general cargo, both import and export. These facilities are extensive and in good physical condition but are extremely under–utilized in terms of their cargo–handling capabilities.

From an overall perspective, the transportation function of the Port of Toronto has only a local or regional importance. The Port serves a limited number of users who are active in the Metropolitan Toronto market. The Port does not influence major national or international trade or transportation networks.

The Port and the City

All North American port cities began because they were accessible to water at a time when transporting people and goods depended on water and natural harbour areas; they developed into cities — and centred around waterfronts — because industrial and commercial activities were both responsible for and dependent on the existence of ports. The type of waterfront industry that developed determined the nature of each waterfront and thus the nature or character of the city itself.

Over time, the relationship between many port cities and their working waterfronts changed as ship sizes, cargo–handling methods, improved inland transportation networks, and labour requirements affected the way the port and the city depended on each other. For example, containerization, which requires large, efficient vessels, minimal manual labour, and intermodal transportation links, has lessened the degree to which the port and the city fulfill each other's needs. In many cases, the traditional port hinterland with its cargoes, consumer markets, and labour supply, no longer exists.

Sometimes a city changes physically as the port becomes separate from the downtown core of the city: terminals are moved to outer harbour areas that can accommodate vessels, where cargoes can be stored and distributed, where intermodal connections can be established and heavy industry be carried on. The rapid growth of urban areas and the need for an accessible waterfront to relieve the stress of urban life have created land-use pressures on the traditional working port waterfront.

It is most likely however, that the port — which is often defined in terms of economic development and the contribution of waterborne trade to the local and regional economy — will continue to be an economic generator for the city. The validity of this relationship depends, of course, on the need for commercial shipping operations, their efficiency and financial viability. In addition to increasing cargo throughput, ports must help improve the economic health of the local area by creating jobs, dispersing wages to the local community, and increasing sales by local merchants.

Port authorities have always tried to meet the needs of port-related industries, whether by exchanging land for mutually useful purposes, entering joint ventures for new terminals or creating and promoting economic development that benefits the community at large.

The relationship between the port and its city is continually changing, with the rate of change increasingly linked to the demands of people living in an urban environment.

The historical relationship between the Port of Toronto and the City of Toronto has been examined in detail elsewhere, but it should be noted that recent changes include the physical separation of the Port from the City, with all commercial shipping now in the Port Industrial Area, rather than on the Central Waterfront. The loss of such marine cargoes as coal, and reductions in other commodities and in general cargo, have reduced the Port's overall role in urban Toronto. Moreover, changing technologies, such as oil pipelines and conversion to natural gas, reduce the importance of the Port in providing basic energy needs to City residents. The Port is still essential in serving several waterfront industries, although truck and rail are far more important in transporting consumer goods into and out of the Toronto area.

The pressure for alternate land uses in the Port Industrial Area reflects the change in the port–city relationship in Toronto. The area is perceived as a resource for housing, recreation, and open space, as well as for industrial and commercial activities — in other words, as an urban resource and not necessarily for transportation purposes. While the complex relationship continues to evolve, there is no existing model to which one can look for guidance in future decisions about the relationship between port and city.

In many ways, Toronto's Port Industrial Area has become an industrial park, with the majority of the tenants not involved in port–related activities. Reductions in tonnage, under–utilization of terminals and — perhaps more significantly — a lack of new port–related developments underscore the evolution of the area land use. In certain parts of the PIA, land–use activities are no different than in many other urban–based industrial parks and are not particularly intensive.

The relationship between the Oshawa Harbour Commission and the City of Oshawa appears to be in transition. In 1984, there was a co–operative effort in preparing the Oshawa Harbour Development Plan, including full public consultation. The plan, while still conceptually valid, has not been implemented because low port traffic levels cannot justify an expansion proposal. There appeared to be a consensus on the nature of development in the port area, but, over the next few years, it seemed to disappear. City Council recently directed that a comprehensive planning study be undertaken to address a number of land–use and other policy issues, and to determine the most appropriate future development for the area. Consequently, in October 1989, Oshawa City Council passed an Interim Control By–law to temporarily prevent inappropriate or premature development in the Southeast Oshawa study area, which includes the Port of Oshawa. In light of changes in the demand for traditional port facilities and competing land–use interests, there recently have been development applications for residential, commercial, and industrial development in the Southeast Oshawa Interim Control Area. In many ways, the Oshawa port–city issues are very similar to those in Toronto.

Port Relationships Within the GTA

A review of ports in the GTA, and their clients and markets, shows that the relationship between them is spatial and there is an absence of any real transportation system or network links among them. They are not complementary, although there is some competition among certain of them.

Although the harbour commissions (including, for the purpose of this regional perspective, Hamilton) are part of the same federally administered system, only informal links exist between them. Each authority is administered under a different federal act; The 1911 *Toronto Harbour Commissioners Act*; the 1912 *Hamilton Harbour Commissioners Act*; and the 1964 *Harbour Commissions Act*, each of which deals with an individual body's responsibilities, accountability, authority, and relationship with the federal government through Transport Canada.

Each harbour commission operates independently and each seeks to maintain existing traffic and to develop new traffic, by providing adequate terminal facilities and services on a financially viable basis. Port planning and marketing are carried out individually and are not always formally or even informally co–ordinated. This tends to cause an element of competition between the commissions.

Clearly, the market served by each harbour commission has evolved over time. The Port of Toronto and the Port of Oshawa essentially serve the local and regional markets of their host urban areas. Their role in, and impact on, the national transportation system are minimal, if not negligible. Only the Port of Hamilton, with its steel mills and significantly higher traffic volumes, has an impact on the national trading economy and the St. Lawrence Seaway traffic volumes.

There are even fewer network links among the private ports, the location and existence of which are purely a function of the transportation requirements of their individual industries or services. Each is site–specific with marine terminal facilities generally dedicated to one user and a single or limited number of commodities. The location of associated industries and services does not depend at all on the commercial ports in the area.

Nor are there links between the harbour commissions and the private ports, although some do compete: salt and coal that used to move through the Port of Oshawa are now at the St. Mary's Cement terminal at Bowmanville. Competition also makes it clear that marine traffic is not always captive to one port and it is the private sector user who decides — usually on the basis of price and service — which port will be used. Competition also means that, as user requirements change, the status of the GTA ports will not necessarily remain the same. Competition, or potential competition, is perhaps the only real and substantive relationship among the GTA ports.

THE GTA CONTEXT AND WATERFRONT TRANSPORTATION

Commuter Traffic and Modal Balance

The above description of transportation in the Greater Toronto Area provides a context for considering the problems and opportunities of waterfront transportation. The way in which the GTA is growing, the distribution and mix of population and employment, and the various demographic and economic trends discussed in the previous sections strongly influence the volume, peaking, and modal distribution of traffic seeking to enter the Metropolitan Central Business District (CBD), and much of this traffic uses the waterfront as a corridor for this purpose.

As noted earlier, approximately one–third of the morning peak hour trips crossing the Metropolitan Toronto boundary from the adjacent regions are bound for the CBD. While GO Transit is able to serve an increasing number of these trips by commuter rail and others are able to use the rapid and surface transit systems, a substantial proportion use the private automobile in spite of the high parking charges in the CBD and growing levels of congestion experienced on the Gardiner Expressway, Don Valley Parkway, Lakeshore Boulevard, and other roads providing access to the CBD. This reflects the fact that many people commuting to the central area from the surrounding regions live in areas that are not well served by transit and are not easily accessible to suburban GO Transit stations.

The major highways referred to above have been operating at effective capacity for many years during the peak hour. Growth in peak–period auto traffic has been relatively slow and has been reflected in a lengthening of the peak period, which is almost three hours long in the morning and somewhat longer in the afternoon. The Yonge Street subway south of Bloor Street is also approaching its effective capacity during the peak hours, but additional capacity remains on the Spadina subway serving the downtown area, and growth is being experienced in the traffic on both lines. The mode experiencing the major growth in trips to the CBD is GO Transit, which had a 20–per–cent growth in traffic on its Lakeshore West line between 1988 and 1989, and an overall increase of 9 per cent in its rail traffic during the same period.

It is clear from these trends that there is substantial transportation demand pressure on the waterfront corridor to serve increasing volumes of commuter traffic, a function that may conflict with the ability of the waterfront transportation system to serve local traffic and that also places negative pressures on the environment and amenities of the waterfront area.

Recreational Transportation

The Toronto water-front is a major recreational attraction, both for residents of the GTA and for tourists from other parts of North America and abroad. Major attractions include the Toronto Harbour, Harbourfront and Island Park, Ontario Place, the Canadian National Exhibition, the Skydome, and the various activities and amenities of the waterfront. The waterfront transportation system and the broader GTA system must keep pace with growth in all types of traffic in order to provide an appropriate choice of travel modes to serve recreational traffic, sufficient capacity to handle massive surges such as those generated by Skydome events, and to accommodate parking and other terminal requirements for those using the various travel modes.

Goods Movement

While commuter and recreational traffic have created increasing pressures in the waterfront area, goods movement has become relatively less important in the area. This reflects the continuing relocation of industrial enterprises to suburban locations (offering cheaper land and easier highway access), the northward relocation of railway freight activity (for example, to the CP Agincourt Yard in Scarborough and the CN MacMillan Yard in Vaughan), and the relatively static levels of commodity flow through the Port of Toronto, as described earlier.

Nevertheless, goods movement remains an essential part of any urban area, without which it cannot function. It is important, therefore, that transportation plans for the waterfront area provide for continuing goods movement capability by road, rail, and marine components of the system.

External Transportation

The Port of Toronto and Union Station both serve as terminals for external traffic entering and leaving the GTA. Intercity bus traffic also enters and leaves the CBD via the Waterfront corridor. The major intercity terminal (at Bay and Dundas streets) is not located in the waterfront area, but there are plans for a subsidiary bus terminal on lower Bay Street.

An additional terminal serving external trips, and one of growing significance, is the Toronto Island Airport, which is discussed more fully in the Royal Commission's Publication No. 7, *The Future of the Toronto Island Airport: The Issues*. The importance of this facility has grown under the impact of airline deregulation; scheduled intercity services are now provided to Montreal, Ottawa, London, and Newark, with prospective links to a number of other urban centres in Ontario and adjacent jurisdictions. Annual passengers served by the airport increased from about 40,000 in 1984 to about 400,000 in 1988. Access to the airport, currently provided by shuttle ferry service at 15–minute intervals across the Western Gap, has been the subject of proposed improvements.

It can be seen, therefore, that transportation demands and responses in the waterfront area are strongly influenced by trends and service decisions in the broader GTA transportation system. This is discussed further in Chapter 2, following, which also shows how changes to the waterfront transportation system can have a significant impact on the broader GTA system.

There is an important general influence that GTA transportation is likely to have on waterfront transportation. This relates to the questions of modal supply and demand balance discussed earlier. As noted, the unprecedented growth in auto ownership and in automobile and truck traffic has placed a severe load on the road system serving the Greater Toronto Area and its Central Waterfront. This is particularly true in the rapidly growing suburban areas, but it is also true in the older, central areas. Transportation planners generally recognize, therefore, that if major capacity increases are to be achieved, particularly for long, radial trips between the suburban regions and the downtown area, more use will have to be made of the rail system, including both commuter rail and rail rapid transit. While major expansion of arterial roads and limited–access highways will be necessary in suburban areas, the higher traffic densities and limited space in downtown areas point strongly towards greater use of GO Transit, subways, and LRT in more densely populated parts of the GTA, and particularly for trips to and from the central and waterfront areas. The transportation proposals put forward by various public agencies and private sources for the waterfront reflect this general situation, as described more fully in Chapter 2.

2. WATERFRONT TRANSPORTATION

HISTORY

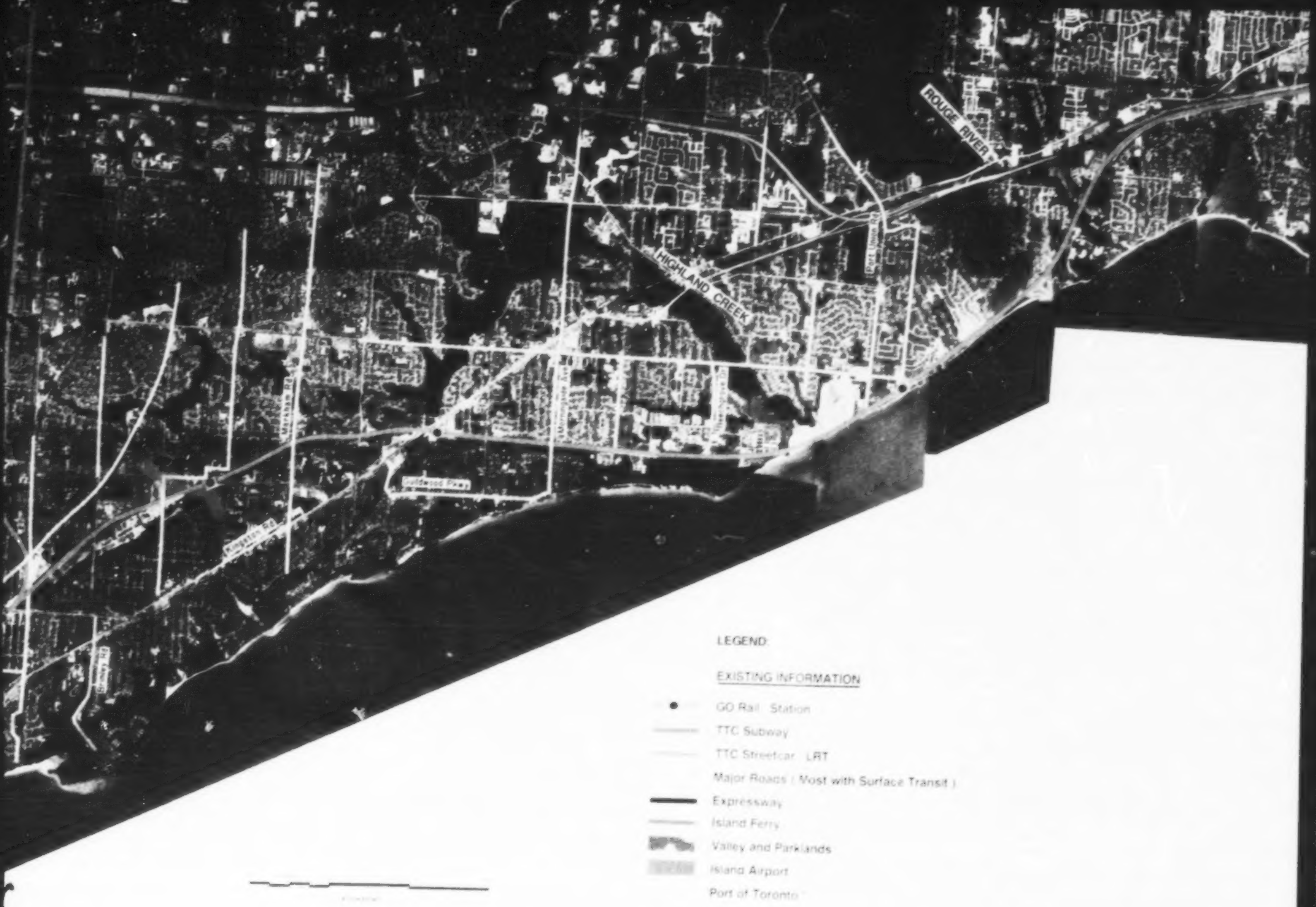
Marine, Rail, Road, and Air Transportation Leave Their Marks

The evolution of "dominant" transportation modes traced in Chapter 1 of this paper has left its mark on Toronto's waterfront, particularly the central section between Dufferin Street on the west and Coxwell Avenue on the east.

The slips and industrial buildings on the mainland side of the Inner Harbour are vestiges of an earlier location of the Port of Toronto, which is now located south of the Keating Ship Channel between Cherry Street on the west and Leslie Street on the east. The Railway Lands, which occupy some 80 hectares (200 acres) between Bathurst and Yonge streets, reflect the heyday of the rail mode, when it dominated both passenger and freight transportation to the extent that the major portion of the Central Waterfront Area was devoted to rail uses, much of it in new areas created by landfill south of the original lakeshore in the vicinity of Front Street. The locations of these major transportation features are shown on Map 1, an aerial photograph which also shows in colour the existing transportation system serving the waterfront area.

In 1958 the Gardiner Expressway was opened, providing elevated, limited automobile access to the CBD, connecting to the Queen Elizabeth Way in the west and the Don Valley Parkway (constructed in 1961) in the east. Parallelling the rail corridor and located to the south of it, the Gardiner Expressway is a dominant feature of the Central Waterfront which creates a visual barrier and negative environmental impacts on adjacent lands at the same time as it continues to provide a high level of automotive accessibility to the central area. To a considerably lesser extent, Lakeshore Boulevard has similar impacts on land uses and the environment in this area.

DON RIVER
Queen St E


ROUGE RIVER
HIGHLAND CREEK
Port Union Rd
Morningside Ave
Markham Rd
Guildwood Pkwy
Kingston Rd
LEGEND
EXISTING INFORMATION
● GO Rail Station
TTC Subway
TTC Streetcar LRT
Major Roads (Most with Surface Transit)
Expressway
Island Ferry
Valley and Parklands
Island Airport
Port of Toronto

EXISTING TRANSPORTATION INFRASTRUCTURE

ROYAL COMMISSION ON THE FUTURE
OF THE TORONTO WATERFRONT
ACCESS AND MOVEMENT GROUP

MAP 1

Air transportation has also made its mark in the form of the Toronto Island Airport, located northwest of the Island Park and linked to the mainland by a shuttle ferry crossing the Western Gap.

Reflecting changing transportation circumstances and pressures for more "people-oriented" land uses in the waterfront area, strong forces have existed and continue to exist, aimed at relocating most of these major transportation facilities. This has already happened to a considerable extent to the port activities, and major changes are now under way in the Railway Lands. At least three basic proposals have also been made regarding the location and function of the Gardiner Expressway.

The following discussion, while reflecting the extended waterfront area which falls within the Royal Commission's mandate, concentrates primarily on the central section within the downtown urbanized area of the GTA since this is the section in which most of the more challenging transportation problems and opportunities exist.

EXISTING TRANSPORTATION SYSTEM

We discuss here the existing waterfront transportation system, as illustrated in Map 1, in terms of roads and surface transit (buses and streetcars), rail and rapid transit, and external connections for intercity and inter-regional traffic.

Roads and Surface Transit

As noted above and described more fully in Publication No. 3 of the Royal Commission, *The Report of the Access and Movement Work Group,* Lakeshore Boulevard and the Queen Elizabeth Way/Gardiner Expressway are the dominant east-west roads serving the waterfront. Lakeshore Boulevard is an urban roadway providing six lanes of capacity between Etobicoke Creek on the west and Leslie Street, with four lanes between Leslie Street and Woodbine Avenue in the east, while the

QEW/Gardiner Expressway is a limited-access six-lane roadway serving the area from Highway 427 (and points west) in the west to the Don Valley Parkway and Leslie Street in the east. The Gardiner Expressway is elevated between a point just east of Dufferin Street and the expressway's eastern extremity.

Most of the north-south arterial roads serving the south part of Metropolitan Toronto extend into the waterfront area and intersect with Lakeshore Boulevard, and most of the major ones have interchanges with the Queen Elizabeth Way and the Gardiner Expressway. Important exceptions to this are University Avenue, which does not traverse the Railway Lands, and Dufferin Street, which is diverted by the Canadian National Exhibition (CNE) grounds.

East-west streetcar services on King Street and Queen Street provide important surface transit services, with the latter extending westward from Roncesvalles Avenue on a separate right-of-way to the Humber Loop, just west of the Humber River, where it connects with the Long Branch streetcar line which runs along Lakeshore Boulevard to Etobicoke Creek. North-south streetcar service is provided by the King Street car, which swings north on Roncesvalles Avenue and links with the Bloor-Danforth subway, and the Bathurst line, which provides a similar link to the Bloor subway and swings west in the waterfront area along Fleet Street into the CNE grounds. In the east, the Kingston Road streetcar provides connections to the north of Queen Street and the King streetcar on Broadview Avenue links Queen Street with the Danforth subway. These services are shown in red on Map 1. As shown in yellow, there are bus routes on most of the north-south arteries serving the waterfront and also an east-west bus along the Queensway between the Sherway Shopping Centre in the west and Humber River in the east.

Rail and Rapid Transit

The GO Transit rail lines serving the area are shown in green on Map 1 and the stations are shown as black dots. Seven lines converge on the system hub at Union Station, providing service from Hamilton and Burlington along the Lakeshore West line, from Milton, from Georgetown, from Bradford, from Richmond Hill, from Stouffville, and from Whitby along the Lakeshore East line, respectively. Within the waterfront area there are GO Transit stations along the Lakeshore West line at Long Branch (just east of Etobicoke Creek), at Mimico (just east of Royal York Road), and at the CNE (east of Dufferin Street). There are no GO stations serving the eastern waterfront in the central area; the first station east of Union Station is at Danforth (with connections to the Main Street station on the Danforth subway line), followed by the Scarborough, Eglinton, Guildwood, and Port Union stations. Capacity problems currently being experienced at Union Station have prompted consideration of steps to expand the capacity of that station and possibly to provide other GO stations serving the Central Waterfront Area, if appropriate public transportation connections can be provided, as described further below.

The Yonge-University-Spadina subway provides high-capacity rapid transit connections between Union Station and areas to the north. The Harbourfront Light Rapid Transit (HLRT) system (expected to be operating by late 1990) provides an underground streetcar connection from Union Station south along Bay Street to Queen's Quay, where it turns west and becomes a surface route in a separate right-of-way along Queen's Quay as far as Spadina Avenue. Spadina Avenue has been widened to six lanes where it crosses the Railway Lands, with provision for an LRT line in the median. The LRT tracks will be laid as far north as King Street in order to provide connections to storage and maintenance facilities for the Harbourfront LRT cars; a northward LRT connection up Spadina Avenue to the Bloor subway has been under study for some years, and is currently in the environmental assessment process.

External Connections

The Port of Toronto provides external marine connections for freight transportation, and there are also limited passenger connections via this mode, primarily in the form of occasional cruise ships. At a more local level, the Toronto Transit Commission provides ferry service from the foot of Bay Street to three points in the Toronto Islands: Hanlan's Point to the west, Centre Island in the middle, and Ward's Island to the east.

The Toronto Island Airport provides scheduled air links to Montreal, Ottawa, London, and Newark as well as charter services. The growing importance of these services is indicated by the 1988 annual volume of about 400,000 passengers, up from 40,000 per year in 1984. The downtown location of this airport provides extremely convenient service for those living and working in the central areas of Metropolitan Toronto, but it plays a relatively minor role in comparison with Pearson International Airport, which serves approximately 45 times as many passengers per day. Current plans of the Toronto Harbour Commissioners and some airlines call for terminal improvements and increased service levels at the TIA, which could lead to increased volumes.

Union Station, in addition to its role as the hub of the GO commuter rail system and the downtown extremity of the Yonge-University subway, is also the hub for VIA intercity rail passenger services. Recent cuts in VIA services imposed by the federal government have reduced the number of intercity trains using Union Station, but possible replacements for some of these services are under study, as discussed further below.

DEMAND TRENDS AND OUTLOOK

Recent traffic trends, considered in relation to available transportation capacity, are an important indicator of the need for transportation improvements. This section discusses recent transportation demand/supply trends and the current outlook, focussing first on local waterfront traffic, then on regional traffic within the GTA, and finally on inter-regional traffic between the GTA and other regions and urban centres.

Local Traffic

The nature of local traffic, trips which have one or both ends within the waterfront area, depends on which part of the waterfront is being considered. West of Dufferin Street and east of the Don River, much of this traffic is to and from residential areas and retail and other population-serving commercial enterprises, as well as the industrial areas in south Etobicoke. In the central area, much of the traffic in earlier years was industrial and port-related, but this has been largely replaced by residential and commercial traffic reflecting the redevelopment of the harbourfront area. Throughout the entire waterfront, recreational traffic is an important component, particularly in the central area (to and from the Toronto Islands, the CNE and Ontario Place, Harbourfront, and the Leslie Street Spit), but also to specific recreational attractions in the western and eastern parts of the waterfront. This recreational traffic is local, regional, and inter-regional in character.

Traffic volumes on the streets serving primarily local traffic in the waterfront have generally shown steady growth where capacity for such growth has been available. Reflecting the lack of continuity of some north-south streets in the central area and the substantial traffic volumes generated by regional traffic to and from the CBD, many of these streets have been operating essentially at capacity during peak periods for some time. Examples include Bathurst Street, Spadina Avenue, and York, Bay, and Yonge streets in the sections between Front Street and Lakeshore Boulevard.

Looking to the future, the extent to which local traffic experiences continuing growth will depend both on the nature and density of future land uses in the waterfront area, and the extent to which the transportation system is expanded to carry additional traffic. Major parts of the Central Waterfront which may be subject to redevelopment for residential, commercial, industrial, and/or recreational uses, include the Ataratiri development at the lower end of the Don River, Greenwood Racetrack, the Toronto Port area south of Lake Shore Drive between Cherry Street and Leslie Street, the Exhibition Place/Ontario Place area, industrial areas north of Exhibition Place, in South Etobicoke, and elsewhere, and the Motel Strip along the west side of Humber Bay. Plans for Exhibition Place and Ontario Place will be strongly affected by whether or not Toronto is successful in attracting the 1996 Summer Olympic Games and/or Expo 2000.

A wide variety of development options exist, both in degree and in location, but it is clear that there is substantial interest among key public-sector and private-sector participants in considering significant intensification. Recent work by consultants and the Metro Toronto Planning Department regarding possible extensions to the Harbourfront LRT line suggest that these could lead to increases of up to 88,000 in the resident population between the Humber River and Woodbine Avenue south of Queen Street, plus increases of up to 125,000 jobs in the same area. The Greenwood Racetrack in the east and the industrial lands west of the Humber also provide opportunities for redevelopment into residential, commercial, and recreational uses.

The extent to which such redevelopment occurs will be strongly affected by the recommendations of the Royal Commission, the City of Toronto, the City of Etobicoke, the Municipality of Metropolitan Toronto, and the Province of

Ontario, and these in turn will affect transportation requirements in the area. It is clear, however, that additional transportation capacity, if it is to be provided, will have to come mainly in the form of public transportation, with emphasis on rail rapid transit and commuter rail services, since only limited expansion of the road network would be feasible because of space limitations and related impacts.

In summary, local traffic in the Toronto waterfront area could experience major growth if some or all of the redevelopment proposals now under consideration were to occur. In planning such redevelopment and assessing the extent to which it is desirable, an important factor affecting transportation, as noted in Chapter 1 of this paper, is the balance between residential and non-residential development. If the primary emphasis is on non-residential (e.g., commercial, recreational) development this could be expected to attract daily flows of commuter traffic from residential areas outside the waterfront, thereby adding considerably to traffic loads on relevant facilities. If, on the other hand, much of the new development is residential and there is a good balance between the number of people and jobs in the area, many of the commuting trips will be local and short, and could be served very efficiently by LRT and surface transit routes. It can be seen from the population and employment numbers quoted earlier that there could be a high degree of balance between the number of new residents and new jobs in the prospective developments being considered.

Regional Traffic

The primary component under this heading is commuter traffic to and from the CBD and related commercial and goods traffic serving the entire central area of the GTA. As noted earlier, the major facilities carrying this traffic are the Gardiner/Lakeshore Corridor, the GO Transit system, and the Yonge-University-Spadina subway line. Arterial roads, streetcar lines, and bus routes serving the area are also important, but the trends on the first three facilities are a good indicator of the overall demand/supply balance.

As shown in Exhibit 16, vehicular traffic volumes on the Gardiner Expressway and Lakeshore Boulevard outbound during the p.m. peak hours were relatively stable during the 1980s. When these volumes are compared with the nominal capacity of the two roadways, it can seen that they have essentially been operating at capacity for the entire decade, suggesting that the lack of growth is due to the capacity restraint. This is reflected in the observed "spreading" of the peak period on these roads: during the past few decades, rush-hour conditions, which used to last for about an hour, have expanded such that the peak period is now approximately three hours long in both morning and evening periods.

As also shown in Exhibit 16, there has been very substantial growth in the number of passengers carried by GO Transit during the 1980s. This reflects both the expanded service levels and capacity provided by GO Transit, and the rapid growth in trips between areas outside Metro Toronto and the Metro CBD, as described earlier in Chapter 1. The evidence suggests that there is additional latent demand for commuter rail services and significant ridership increases could be achieved if additional trains were added on lines now served and possibly if service were provided on additional lines such as the CP MacTier subdivision to the northwest and the Havelock subdivision to the northeast.

As shown at the bottom of Exhibit 16, volumes on the Yonge-University subway southbound from Bloor Street to the central area in the a.m. peak hours have been relatively stable during the 1980s. It seems likely that these trends reflect capacity limitations on the Yonge line, particularly in the section south of the Bloor subway and at the intersection between the Yonge and Bloor lines, and also the fact that most

EXHIBIT 16
WATERFRONT CORRIDOR TRAFFIC TRENDS

GARDINER EXPRESSWAY/LAKE SHORE

	Nominal Capacity		PM Peak Hours Outbound Traffic Trends					
			Westbound West of Jameson Ave.			Eastbound East of Sherbourne St.		
	Westbound	Eastbound*	1981	1985	1989	1981	1985	1989
Gardiner Expressway	6,000	5,000	7,000	6,900	6,149	4,200	4,550	4,441
Lake Shore Boulevard	3,000	1,000		3,086			613	
Total	9,000	6,000		9,986			5,163	

GO TRANSIT

	Nominal Capacity		Daily Riders from Union Station		
	Outbound Trains per day	Outbound Seats per day	1981	1985	1989
Lakeshore West Line	27	32,886	12,205	11,440	15,739
Milton Line	5	4,860	-	2,244	4,536
Georgetown Line	4	4,050	2,496	2,566	3,409
Bradford Line	1	972	-	373	680
Richmond Hill Line	4	3,240	1,083	1,039	2,178
Stouffville Line	2	1,458	-	489	817
Lakeshore East Line	26	32,724	8,183	9,499	11,193
Total	69	80,190	23,967	27,650	38,552

YONGE/UNIVERSITY SUBWAY

		AM Peak Hour Volumes Southbound from Bloor Street		
	Nominal Capacity	1981	1985	1988
Yonge Subway	33,600	32,000	27,000	27,500
University Subway	33,600	22,000	20,500	23,500
Total	67,200	54,000	47,500	51,000

* Limited by downstream constraints on the Don Valley Parkway and Lake Shore Boulevard.

SOURCE: Metro Toronto Transportation Department, GO Transit, Metro Toronto Planning Department, respectively.

of the GTA population growth during the past decade has occurred beyond the Metro boundaries, while the subway lines provide a high level of service only within Metro.

The outlook for regional traffic is similar to that for local waterfront traffic in many respects. This applies in particular to its dependence on the rates and types of redevelopment in the financial district and shoulder areas and the importance of rail transit and commuter rail in providing the required additional capacity, in combination with marginal road improvements. To the extent that the main traffic increases would be carried by GO Transit and the subway, there would be a relatively small impact on facilities carrying local traffic in the waterfront, with the major exception of Union Station. To the extent that additional capacity is provided on the Gardiner/Lakeshore roadways, there will be more regional traffic passing through the waterfront; the additional capacity would, however, benefit recreational traffic to and from the waterfront, and particularly that moving in off-peak periods.

Inter-regional Traffic

As described in Chapter 1, goods traffic through the Port of Toronto is relatively stable and only modest increases are anticipated. Goods movement on the road and freight lines serving the waterfront/Port area is a relatively minor load, such that major problems are not foreseen provided that the required road and rail facilities remain available in appropriate form.

Traffic through the Island Airport has been growing, as noted earlier, and substantial additional growth is possible. Any further growth or change will be subject to policy decisions by the City of Toronto, the Toronto Harbour Commissioners, and the Government of Canada, in the context of the Tri-Partite Agreement. The existing airport ferry access is adequate for current traffic levels, but improvements would be required if significant traffic increases were contemplated.

As noted earlier, federal policies have resulted in decreased intercity rail services using Union Station, but possible future developments may result in additional intercity passenger services and volumes. There are strong arguments for keeping this option open, and this would seem to be quite feasible even as GO Transit commuter volumes continue to increase, as discussed below.

CHALLENGES AND OPPORTUNITIES

The situation described in the previous two chapters constitutes a challenge, in that significant parts of the existing transportation system serving the waterfront and the central area of Metropolitan Toronto are operating at or close to capacity, while there are continuing pressures for development and redevelopment which may impose increased traffic demand levels and will very likely change the character and distribution of local, regional, and inter-regional traffic in the waterfront area. This situation also offers major opportunities, however, since there are important trade-offs and interactions among the various developments and transportation improvement possibilities. These are summarized briefly in this section.

The Waterfront as a Corridor: Coping with Through Traffic

As noted earlier, it is likely that the road network serving the Greater Toronto Area and its waterfront, already heavily loaded, will experience increasing levels of congestion even with the improvements and expansions which are planned and others yet to be agreed on. Major increases in capacity, particularly in central areas of the GTA, are achievable primarily through commuter rail and rail rapid transit improvements and expansions. This implies that GO Transit will be the major expansion mode for through traffic in the waterfront corridor, and that even with marginal expansions to the road network, peak periods will lengthen and increasing levels of congestion will be experienced.

Two opportunities inherent in this situation are worth noting. The first of these is that any improvements to the road or rail system serving the corridor for regional traffic, while they are likely to be fully loaded during peak periods, will enhance the capacity and level of service available for recreational and other off-peak traffic in, to, and from Toronto's waterfront. The second opportunity relates to GO Transit. Current capacity limitations experienced by GO Transit are more a result of station access limitations than of line haul limitations. One approach to this problem would be to provide more stations, but each additional station added to a commuter rail line slows down the average speed of the trains because of the additional time spent decelerating, stopping, and accelerating. Recognizing that it is in competition with the automobile mode, GO Transit has not wished to add additional stations, since the reduced average speeds might mean a loss of market share. Since, however, average automobile speeds in parts of the GTA have been decreasing due to increasing congestion, and are expected to go on decreasing in the future, there is an opportunity for GO Transit to add additional stations and thereby to increase access to the rail system and the system's effective capacity while still remaining competitive with the automobile mode. The implications of this in terms of more GO Transit stations serving the waterfront area are outlined in the following chapter.

The Waterfront as a Place: Redevelopment and Recreational Proposals

The implications of increased residential population, more jobs, and expanded recreational attractions in the waterfront area in terms of increased local, regional, and inter-regional traffic were outlined in the previous chapter. One important means of ameliorating such traffic problems is to encourage balanced residential, commercial, industrial, and recreational development, so that many of the resulting new jobs will be held by those living in the local area. If this approach is followed, and many of the redevelopment proposals incorporate this principle, many of the new trips generated in the waterfront will be short, local trips which can be served efficiently and effectively by surface transit and light rapid transit, and this will also likely lead to an increase in pedestrian and bicycle trips under appropriate weather conditions. This is an important opportunity, which would enhance the attractiveness of the waterfront as a people place, while helping to lessen the need for increased transportation capacity to serve long commuting and recreational trips.

The Waterfront and Special Events: 1996 Olympics and World Fair 2000

There is a possibility that the 1996 Summer Olympics and/or the World Fair 2000 may be attracted to Toronto. If either event occurs here, there will be a substantial impetus for recreational, residential, and related development in and around areas such as Exhibition Place/Ontario Place and other locations in the extended waterfront. There would be greatly increased demand for recreational traffic during and preceding these events, which would require expanded commuter rail, rail transit, surface transit, and road/parking facilities and services. This would obviously be an important challenge in terms of the planning and implementation activities required in a rather short time period. It would also be, of course, an opportunity to achieve significantly expanded recreational and residential/commercial developments and improved transportation.

Transportation as a Means to an End

Many of the development and redevelopment proposals in the waterfront area would be placed at a severe disadvantage if accompanying transportation improvements were not also made. The various transportation proposals which are now "on the table", as outlined in the next section, should be considered in this context, also recognizing the important interactions between various types of transportation and land use, and the inherent opportunities as outlined above.

WATERFRONT TRANSPORTATION PROPOSALS

Many proposals for improved or relocated transportation facilities and services have been made for the waterfront area. Most of these have originated from public agencies, but significant proposals have also been made by members of the private sector. It is impossible in a paper of this type to describe all such proposals; the following sections outline some of the more major and generic proposals as a basis for public consideration and discussion.

Arterial Roads

Proposed arterial improvements include the following:

- an upgraded Dufferin Street which would pass around the north side of the Exhibition Place grounds, along the alignment of Manitoba Drive to connect with an improved Fleet Street;
- possible relocation of Fleet Street to an alignment north of the Molson property between Strachan Avenue and Bathurst Street;
- westward extension of Front Street from Bathurst Street to connect via a new ramp to the Gardiner Expressway west of Strachan Avenue;
- reconstruction of Bathurst Street between Front Street and Lakeshore Boulevard;
- a possible tunnel connection to the Toronto Island Airport from the foot of Bathurst Street for use by buses and service vehicles only;

- a major new east–west "spine" road (called The Esplanade) from Bay Street to Bathurst Street and possibly to west of Strachan Avenue on a relocated Fleet Street (providing four lanes with a median capable of accommodating a future transit facility);
- reconstruction of Spadina Avenue to six lanes with provision for a streetcar LRT in the median (the section between Front Street and Lakeshore Boulevard is scheduled for completion in 1990);
- an extension of Simcoe Street (four lanes) south from Front Street under the railway corridor and connecting with Lakeshore Boulevard and Queen's Quay;
- widening of York Street from Front Street to Queen's Quay to six lanes;
- widening of Bay Street between Front Street and Queen's Quay to six lanes (as part of the Harbourfront LRT construction);
- new crossings of the rail corridor at Peter Street (built) and Portland Street; and
- proposed widening of the lower end of the Bayview Avenue Extension, adding a third, reversible lane.

A 600-car parking garage near the foot of Bathurst has been under consideration by the Toronto Parking Authority to accommodate traffic growth at the Island Airport if necessary. The City of Toronto has proposed major rearrangements of ramps to and from the Gardiner Expressway between Spadina Avenue and Yonge Street. The changes referred to earlier in and adjacent to Exhibition Place will create increasing pressure for upgrading of Strachan Avenue, which is a City of Toronto road, and there is a proposal to connect lower Strachan Avenue to Shaw Street.

Gardiner Expressway

The most immediate and likely change to the Gardiner Expressway is a proposed widening by one lane in each direction from the Humber River to a point west of Strachan

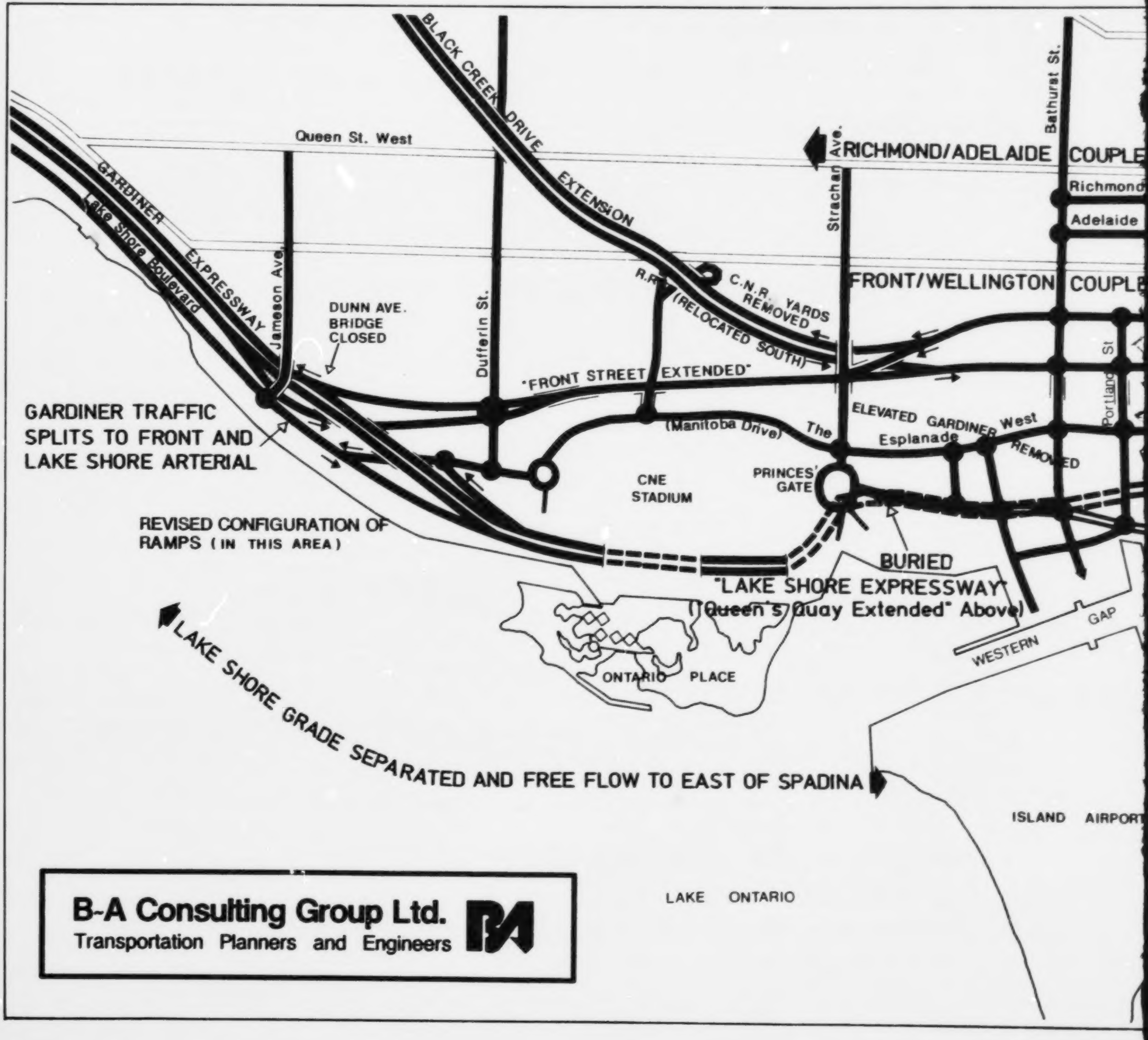
Avenue where the proposed Front Street connection ramps would join the expressway. This would add approximately 2,000 vehicles in capacity per hour to the Gardiner/Front combination, which would carry an additional 2,600 commuters per hour at current peak-hour vehicle occupancies. It would also provide additional capacity for recreational traffic to and from attractions in the waterfront area.

The possibility has also been raised by planners for the World Fair 2000 of relocating Lakeshore Boulevard to an alignment north of Exhibition Place, tying into the general alignment of Fleet Street and then back to the existing Lakeshore Boulevard to the east. This possibility would be considered more strongly if World Fair 2000 were attracted to Toronto, since it would allow closer integration of Exhibition Place and Ontario Place to accommodate the fair.

Several alternate proposals have been made to remove, replace or relocate the elevated portion of the Gardiner Expressway in order to reduce the barrier effect and other environmental impacts of the existing elevated section. In generic terms, these are as follows:

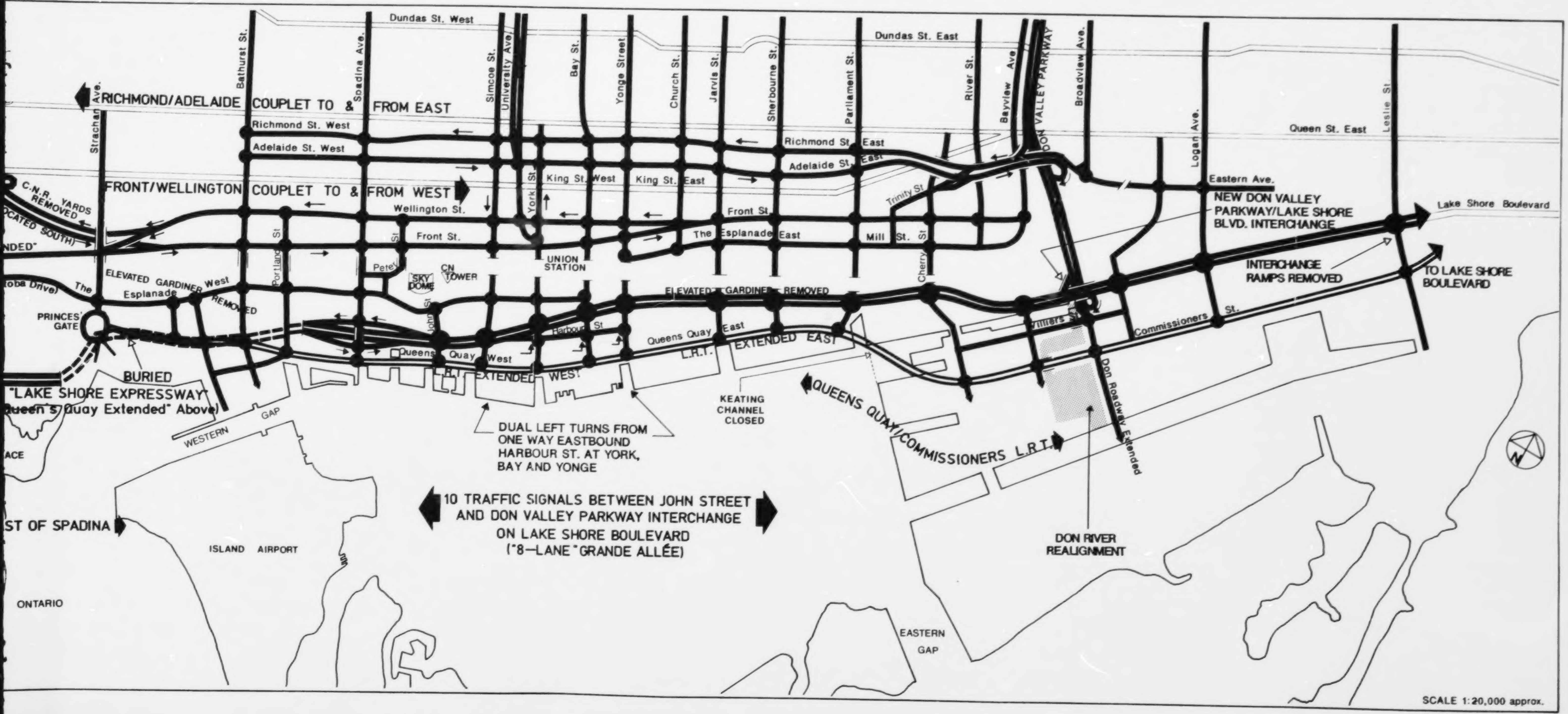
1. Remove the elevated section of the Gardiner Expressway and replace it with a widened Lakeshore Boulevard, other arterial connections, and more public transit. A paper outlining one version of this concept was submitted to the Royal Commission on the Future of the Toronto Waterfront by B-A Consulting Group Ltd. in December 1989. As shown in Exhibit 17, under this proposal Wellington and Front streets would become a one-way pair connected in the west to the at-grade part of the Gardiner Expressway and to a southward extension (in the rail corridor that carries the Georgetown GO service) of Black Creek Drive from St. Clair Avenue to the waterfront. In the east the Richmond/Adelaide one-way pair would connect to the Don Valley Parkway. Improved east-west and north-south arterial connections would help to replace the capacity of the existing central

EXHIBIT 17: LAKE SHORE CORRIDOR TRANSPORTATION CO


BLACK CREEK DRIVE EXTENSION
Queen St. West
RICHMOND/ADELAIDE COUPLE
Bathurst St.
Strachan Ave.
Richmond
Adelaide
GARDINER EXPRESSWAY
Lake Shore Boulevard
Jameson Ave.
DUNN AVE. BRIDGE CLOSED
Dufferin St.
R.R. (RELOCATED SOUTH)
C.N.R. YARDS REMOVED
FRONT/WELLINGTON COUPLE
"FRONT STREET EXTENDED"
Portland St
GARDINER TRAFFIC SPLITS TO FRONT AND LAKE SHORE ARTERIAL
(Manitoba Drive)
The Esplanade
ELEVATED GARDINER West REMOVED
CNE STADIUM
PRINCES' GATE
REVISED CONFIGURATION OF RAMPS (IN THIS AREA)
BURIED "LAKE SHORE EXPRESSWAY" ("Queen's Quay Extended" Above)
WESTERN GAP
ONTARIO PLACE
LAKE SHORE GRADE SEPARATED AND FREE FLOW TO EAST OF SPADINA
ISLAND AIRPORT
LAKE ONTARIO

B-A Consulting Group Ltd.
Transportation Planners and Engineers

R TRANSPORTATION CONCEPT


Dundas St. West
Dundas St. East
Bathurst St.
Spadina Ave.
Simcoe St.
University Ave.
Bay St.
Yonge Street
Church St.
Jarvis St.
Sherbourne St.
Parliament St.
River St.
Bayview Ave.
DON VALLEY PARKWAY
Broadview Ave.
Logan Ave.
Leslie St.
Strachan Ave.
RICHMOND/ADELAIDE COUPLET TO & FROM EAST
Richmond St. West
Adelaide St. West
Richmond St. East
Adelaide St. East
Queen St. East
King St. West
King St. East
Eastern Ave.
FRONT/WELLINGTON COUPLET TO & FROM WEST
C.N.R. YARDS REMOVED
OCATED SOUTH)
NDED"
Wellington St.
York St.
Front St.
The Esplanade East
Mill St.
Trinity St.
Cherry St.
NEW DON VALLEY PARKWAY/LAKE SHORE BLVD. INTERCHANGE
Lake Shore Boulevard
Portland St.
Peter St.
John St.
SKY DOME
CN TOWER
UNION STATION
toba Drive
The Esplanade
ELEVATED GARDINER West REMOVED
ELEVATED GARDINER REMOVED
INTERCHANGE RAMPS REMOVED
TO LAKE SHORE BOULEVARD
PRINCES' GATE
Harbour St.
Villiers St.
Commissioners St.
Queens Quay West
Queens Quay East
L.R.T. EXTENDED WEST
L.R.T. EXTENDED EAST
BURIED
"LAKE SHORE EXPRESSWAY"
(Queen's Quay Extended" Above)
WESTERN GAP
ACE
KEATING CHANNEL CLOSED
QUEENS QUAY/COMMISSIONERS L.R.T.
Don Roadway Extended
DUAL LEFT TURNS FROM ONE WAY EASTBOUND HARBOUR ST. AT YORK, BAY AND YONGE
10 TRAFFIC SIGNALS BETWEEN JOHN STREET AND DON VALLEY PARKWAY INTERCHANGE ON LAKE SHORE BOULEVARD ("8-LANE" GRANDE ALLÉE)
ST OF SPADINA
ISLAND AIRPORT
ONTARIO
DON RIVER REALIGNMENT
EASTERN GAP
N
SCALE 1:20,000 approx.

section of the Gardiner, as would an extended Harbourfront LRT line and other transit improvements. Lakeshore Boulevard would be in a tunnel as it passed between Exhibition Place and Ontario Place and under Bathurst Street, and would have better urban design treatment and improved connections to north-south arterials through the Central Waterfront Area. These improvements could, and would have to, be made before the elevated section of the expressway could be removed. An important question regarding this proposal, apart from its cost, is the extent to which the arterial and transit improvements could perform the transportation functions now carried out by the Gardiner Expressway. This is not in any way a firm proposal, but represents an attempt to illustrate the scope and type of road and transit improvements that might have to be made if the elimination of the elevated section of the Gardiner were to be seriously and realistically considered.

2. Relocate the Gardiner to a tunnel beneath Lakeshore Boulevard from the Don Valley Parkway to Bathurst Street. Burying the Gardiner was proposed as an essential step by the Toronto Waterfront Charrette, which was sponsored by the Ontario Professional Planners Institute, the Ontario Association of Architects, and the Ontario Association of Landscape Architects in September 1989. The preference of the planners and architects involved in this exercise was to bury the Gardiner beneath a broadened, tree-lined version of Lakeshore Boulevard. This concept would remove the Gardiner as a visual barrier while retaining it as a limited-access roadway. It has been noted, however, that the combined construction project of removing the elevated Gardiner, placing it in a tunnel under Lakeshore Boulevard, and improving the latter would require that both roadways be closed for an

extended period during construction and that the loss of their combined capacity would be extremely disruptive during that time.

3. Relocate the elevated portion of the expressway into a new tunnel just south of the existing shoreline, with creation of new parkland on landfill above the tunnel, throughout the Inner Harbour waterfront. A proposal of this nature was originally put forward by Colin Bent Associates, and a more recent proposal by developer William Teron and his associates (Four Guys Off the Wall) would include financing of the new tunnel and expressway through sale of the development rights on land currently occupied by the elevated section of the Gardiner Expressway and other waterfront lands, for development by Mr. Teron's firm. A number of potential benefits and costs have been identified for such a scheme: on the plus side, it would remove the Gardiner Expressway barrier while retaining its function, the new expressway could be constructed before the elevated section would be torn down, it would provide additional parkland along the Inner Harbour shoreline, and it could offer the possibility of at least partial private-sector funding of the very considerable capital cost; on the minus side would be the complexity of connections to north-south arterial roads, the additional traffic adjacent to the shoreline and crossing Queen's Quay, and the concern expressed by some observers that the major developments which would be required to provide the necessary funding through sale of development rights would create another barrier between the GTA's central area and its waterfront, replacing the former expressway barrier.

4. Retain the elevated Gardiner Expressway, with appropriate widening and ramp improvements as discussed earlier, but with improved lighting and urban design in conjunction with related development adjacent to the expressway, in order to reduce its negative environ-

mental and barrier impacts. This approach was proposed by a civic design study in September 1988 prepared for the Task Force on the Gardiner/Lakeshore Corridor by a consultant team of architects, urban designers, and consulting engineers headed by du Toit, Allsopp, Hillier. This would provide some environmental amelioration and would retain the existing elevated section of the Gardiner Expressway, thereby likely having a significantly lower capital cost than the other three options, but the basic barrier effect would still remain, as would the relatively high cost of annual maintenance and rehabilitation of this aging facility.

The above are all conceptual proposals and those involving major change would require functional, design, financial, economic, and environmental study before decisions could be made regarding possible removal or relocation of the Gardiner Expressway. A recent report by the Metropolitan Toronto Transportation Department (January 1990) examined the basic alternatives from the traffic engineering point of view (but without, we understand, having seen the B-A Consulting Group Ltd. conceptual proposal). It concluded that retention of the existing elevated section, with appropriate engineering and urban design improvements, would be the most practical alternative, although relocation to a tunnel under the Inner Harbour shoreline was considered a possibility if a private-sector funding approach could be worked out to help finance the substantial cost.

There are important differences among these alternatives in terms of traffic impacts, costs, and implications for the urban and recreational environment offered by the Central Waterfront Area. This is a very basic issue and the Royal Commission on the Future of the Toronto Waterfront has made it clear that it welcomes such submissions and will review these and related proposals in completing its mandate.

Traffic Management

The Metropolitan Toronto Transportation Department is implementing a Corridor Traffic Management Program in the Gardiner/Lakeshore Corridor, similar to Freeway Traffic Management systems implemented by the Ministry of Transportation of Ontario in the Burlington Skyway and Queen Elizabeth Way corridors and now being implemented in the Highway 401 corridor through the GTA. Systems of this type use traffic detectors and closed-circuit television for early identification of and response to traffic incidents. Changeable message signs and highway advisory radio are used, as appropriate, to warn motorists of congestion ahead and advise them to take alternate routes, if feasible; traffic diversion from the Gardiner Expressway to Lakeshore Boulevard or vice versa, to avoid such a major incident, will likely be part of the Gardiner/Lakeshore Corridor Management system, aimed at assisting the efficient movement of traffic, reducing motorist delays, increasing motorist safety, and making full use of the capacity of roadways in the corridor.

Other transportation management actions are also under study, including other forms of supply management (e.g., improved traffic control systems, enforcement of parking/loading regulations, reserved lanes providing priority use for transit and other high-occupancy vehicles, and related measures to improve the traffic and transit operations) and demand management (e.g., flexible hours and variable parking rates to encourage off-peak travel, service and pricing measures to encourage more use of transit, incentives to encourage higher occupancy of passenger vehicles, and greater loading of trucks). The Royal Commission will be considering innovative measures of this type and their possible impacts on waterfront transportation.

Commuter Rail

A number of station changes are under consideration for the GO Transit Lakeshore West and Lakeshore East lines serving the waterfront area, as follows:

- Relocation of the Mimico Station, at Royal York Road, eastward to Park Lawn Road or possibly farther east adjacent to the Humber Loop where the Queen streetcar line currently terminates, in order to provide improved TTC and road connections to the station. Ramps would be constructed to enhance the movement of vehicles between the Queen Elizabeth Way and the relocated station and its parking areas, so that this station would have an expanded role as a "gateway" intercepting automobile traffic and allowing drivers to transfer to GO Transit or the TTC. A new location for the GO station close to the Humber Loop would also enhance connections between GO and TTC, including a westward expansion of the Harbourfront LRT line, as discussed further below.

- Relocation of Exhibition Station eastward to a location just west of Strachan Avenue, providing dual stations on both the Lakeshore West and Georgetown/Milton lines, with a pedestrian connection between them and enhanced connections to the TTC (e.g., a westward extension of the HLRT, north-south transit on Strachan Avenue), and to parking areas at Exhibition Place.

- Improvements to Union Station, including expanded platforms and connections at the west end, improved intercity platform arrangements (or keeping the option open for future intercity rail improvements), and improved pedestrian connections northward to the Union subway station, westward to the Skydome, and eastward to the Harbourfront LRT Union Station terminal. A master plan is being developed and a possible provincial initiative to take over ownership and management of Union Station and the related rail corridor is under consideration.

- Since construction of the Union Station and related rail corridor during and following the First World War, a number of studies have noted that the corridor, which was purposefully raised above the elevation of Front Street to allow north-south roads to pass under it south of the financial district, would have been less of a barrier had it been depressed so that north-south roads could pass over it (e.g., as is the case for Peter Street, Spadina Avenue, and Bathurst Street). It has been noted that, while either of the two east-west barriers between the City and its waterfront (the elevated rail corridor and the elevated Gardiner Expressway) would be a major impediment to an improved urban environment in the area, the effect of both barriers together is quite overwhelming and has a sterilizing effect on land uses in the area, particularly between the two barriers. A recent study was conducted by Morrison Hershfield Ltd. regarding the physical and economic feasibility of depressing the rail corridor in its present location. The study concluded that this would be a feasible proposition and the economic benefits of doing so would more than outweigh the costs. As with relocation of the Gardiner Expressway, however, the sheer cost and magnitude of the construction effort, and its impact, would require careful consideration and more detailed studies if the concept were to be considered further.

- Creation of a new GO Transit station on the Lakeshore East line between Parliament Street and the Don River to serve the new Ataratiri neighbourhood and waterfront development in that area. This station could have strong connections to the TTC network including an eastward extension of the HLRT, and might also be combined with ramps from the Don Valley Parkway and parking areas in order to serve as a gateway similar to that described above for the relocated Mimico station.

As noted earlier, the new Ataratiri station and the relocated Exhibition Place station, because of their strategic locations in the waterfront area and proposed strong TTC connections, would likely relieve pressure on the capacity of Union Station, since some commuters would find it more convenient to transfer from GO Transit to the TTC at one or other of the shoulder stations. The approximate locations of the stations as described above are shown in Exhibit 18, which also shows potential new LRT extensions in the waterfront network.

Transit

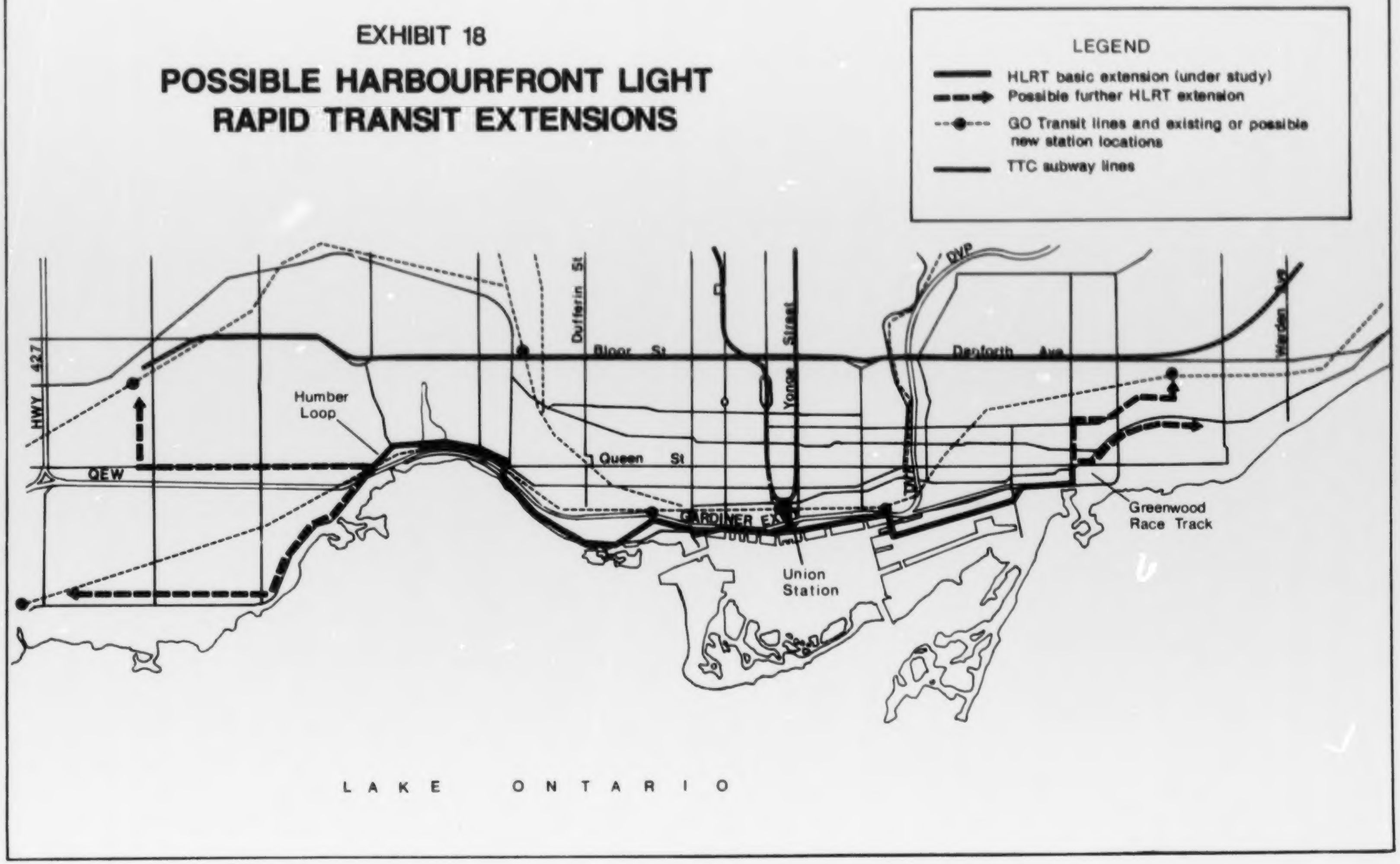
Perhaps the most significant potential transit improvement in the waterfront area would be a westward and eastward extension of the HLRT which is currently under construction between Union Station and the Queen's Quay/Spadina Avenue intersection. The Metropolitan Toronto Planning Department has initiated a consultant study to develop and evaluate a number of alternative networks, associated with several land-use scenarios, and to make recommendations for staged development of an extended HLRT with strong connections to the TTC network and GO Transit.

One of the HLRT networks currently under study is illustrated schematically in Exhibit 18. This would provide an HLRT line extending from the Humber Loop (or from the relocated GO station between the Humber River and Park Lawn Road) eastward to the Greenwood Racetrack. It would also connect with the relocated Exhibition Place GO Station, Union Station, and the new Ataratiri GO station as described in the previous section, as well as with Union Station.

As illustrated, there could be one or two westward extensions from the Humber Loop, one following Lakeshore Boulevard to the Long Branch GO Station and the other following an alignment along the Queensway west to Kipling

EXHIBIT 18

POSSIBLE HARBOURFRONT LIGHT RAPID TRANSIT EXTENSIONS


LEGEND
HLRT basic extension (under study)
Possible further HLRT extension
GO Transit lines and existing or possible new station locations
TTC subway lines
HWY 427
QEW
Humber Loop
Dufferin St
Bloor St
Queen St
Yonge Street
GARDINER EX
Union Station
DVP
Danforth Ave
Warden Ave
Greenwood Race Track
LAKE ONTARIO

Avenue and north to a terminal at the Kipling station on the Bloor subway and the associated GO Transit station on the Milton line. One or two eastward extensions are also possible, as illustrated — one along Coxwell Avenue, and Gerrard and Main streets to the Danforth GO station and the Main Street station on the Danforth subway, and the other eastward along Kingston Road to serve that corridor.

This HLRT "spine" would be closely connected also with the TTC Queen, King, Carlton, and Kingston roads streetcar lines and to all relevant north-south bus lines which are located on all major arterial roads serving the Central Waterfront. It would accommodate many types of trips, including the relatively short local trips within the waterfront corridor associated with new development there, as discussed earlier, and act both as a feeder and distributor of trips to and from the GO Transit express service in the corridor, and as a facility providing access to recreational opportunities throughout the waterfront and offering, in itself, a recreational attraction as a "scenic tour" of the waterfront area.

Other rapid transit concepts which have been suggested west of Union Station include an express subway service in a tunnel under Humber Bay, linking south Etobicoke to the Central Waterfront and serving as a branch of the HLRT, and/or having such a rapid transit line link to surface rapid transit lines on King Street (eastbound) and Queen Street (westbound), which could act as a "one-way pair" of transit lines. Under the latter approach, relevant sections of King and Queen streets might become transit malls, thereby allowing a higher level of transit service and an automobile-free pedestrian environment.

As noted earlier, construction of the proposed Spadina streetcar LRT line between the Bloor/Spadina station and Queen's Quay (connecting to the HLRT now under construction) is currently the subject of an environmental assessment study. This would provide an important improvement in rapid transit accessibility to and from the waterfront area and the Railway Lands redevelopment currently under way and planned.

As part of its Network 2011 plan, Metropolitan Toronto and the TTC proposed the Downtown Rapid Transit (DRT) line, which would run from Pape station on the Bloor-Danforth subway south to Front Street and westward along Front Street past Union Station to the vicinity of Spadina Avenue. A major objective of this line would be to relieve current crowding on the Yonge Street line south of Bloor Street. It was given third-priority status by Metro Council, however, with the proposed Sheppard subway and Eglinton West rapid transit line having higher priority.

Another proposal, put forward by the B-A Consulting Group Ltd., is to construct a subway from Bloor Street south along Spadina Avenue to Front Street and then eastward to Union Station, where it would connect with the Yonge Street subway. Trains moving southward along the existing subway line from the Wilson Avenue terminal would proceed straight south at Bloor Street down the new Spadina Avenue connection and east along Front; at Union Station these trains would continue along the existing Yonge Street line northward to Finch Avenue. The existing "Y" connection at Bloor and Avenue Road would be reactivated so that every second train on the Bloor-Danforth subway line would turn southward down the existing University Avenue line to provide a transfer-free trip to the CBD. The University line would be stub-ended at Union Station. This is a very interesting proposal which would have the advantage of providing a transfer–free subway ride to the downtown core from the west, northwest, north, and east, while providing improved service to the existing and new developments on Front Street West, such as the Convention Centre, Roy Thompson Hall, the new CBC complex, and the new Metro Toronto Civic Centre. It would also likely remove the need for the DRT line, since it would directly relieve pressure on the existing Yonge Street line south of Bloor Street. There would be an obvious redundancy between this proposal and the Spadina LRT connection from Front Street to Bloor Street, and one or other of these proposals would have to be selected.

Provision has been made for a bus terminal of eight or nine stalls to be located under the extended Esplanade just west of Bay Street and south of the rail corridor. This would serve buses providing "trailer" service to GO Transit commuters homebound in the evening after the last p.m. peak commuter train has departed outbound from Union Station.

Pedestrian Ways and Bicycle Paths

As noted in the Access and Movement Work Group's report to the Royal Commission, a continuous bicycle network is needed throughout the waterfront area. The report notes that the City Cycling Committee already has several proposals for the Motel Strip, the Railway Lands, the Martin Goodman Trail, York and Cherry streets, Ataratiri, Tommy Thompson Park, and Leslie Street. The challenge, it suggests, is to integrate cycling facilities with all future redevelopment and to locate both on- and off-street bicycle trails in adjacent areas.

Similar considerations apply to a network of waterfront trails and walkways. The report on access and movement proposes a continuous water's edge walkway, partly on landfill and including public corridors to be negotiated through proposed developments. This should be integrated with walkways and trails along the six major rivers and creeks that run into the waterfront, and with north–south urban walkways, especially those located in the central area, to form a network that brings people close to the water and offers them access to an array of water-related activities.

Goods Movement

There are no proposals for major improvements directly affecting goods movement in the waterfront area. This probably reflects the continuing withdrawal of industrial concerns from the area and the stable level of commodity flows through the Port. It is important to note, however, that no urban area can survive without an effective goods movement system. This means that sufficient road capacity and accessibility must be provided to every part of the area. It also suggests that existing freight rail lines serving the area should be retained where feasible and necessary, with connections to the freight "high line" which has been retained and relocated to the rail corridor serving Union Station and the lakeshore.

Sufficient port facilities, probably at Toronto but possibly relocated to Oshawa, will also be required to handle at least the existing level of commodity flows moving through the Port, as noted earlier in Chapter 1 of this paper, and as discussed in the following section. For example, global warming caused by the "greenhouse effect" may lead to year-round ice-free navigation on the Great Lakes within 50 years. This, in turn, would likely make marine transportation through the St. Lawrence Seaway more competitive with rail transportation for some commodities, which could lead to increased port traffic while reducing space requirements for winter stockpiling. The impacts of global warming, many of which are potentially very negative, such as possible summer droughts and declining water levels in the Great Lakes, are mentioned here to emphasize that transportation (and other) options should be kept open as much as feasible, in order to adapt to changing future circumstances.

The Port Outlook

Opportunities and options in the business of the Port depend on many factors which, to some greater or lesser degree, affect the ports in the GTA. Those factors include:

- the overall potential for developing new traffic;
- industrial developments that will generate or require marine cargo;
- the availability of suitable terminal facilities and adequate terminal capacity;

- the Port's ability to compete with other facilities on price and service;
- the strategic direction taken by the Port;
- the Port marketing program;
- the community perception of the Port;
- external influences affecting port operations and decision-making; and
- the political will to support and promote new port developments.

The Port of Toronto

The outlook for the Port of Toronto is mixed, at best: it serves only local and regional markets, with a cargo base that has not changed significantly in the years since the Port lost coal and petroleum traffic. Although total traffic has stabilized at about two million tonnes per annum, the Port is not a mainstream component of the Canadian transportation system. And while it has the physical capacity to handle increased traffic, it is difficult to forecast whether past levels can be regained in the future.

There are various traffic probabilities for the Port of Toronto:

- Because the consumption of sugar is related to population growth, local and regional market demands, and the availability of sugar substitutes, growth rates of less than two per cent per annum may be in order.
- Cement traffic is directly related to the level of construction activity in the GTA and market activity is expected to grow at perhaps ten per cent per annum and may be higher if Toronto hosts the 1996 Olympic games.
- Salt traffic fluctuates according to weather conditions and to the level of on-site inventories held over from the previous years; it should remain stable.
- General cargo and container trends are difficult to forecast but, at best, will remain as they are.

- Grain traffic appears to be in a state of transition, with an increasing amount moving by truck rather than by ship.

- Aggregate traffic may increase substantially and become a major port commodity.

Cross-lake service has been identified as a possible new traffic source for the Port of Toronto. The concept, which involves the movement of trailered goods on tug–propelled barges between Ontario and New York State, has been discussed for more than a decade; in fact, for a brief time there was a similar service from the Port of Oshawa, albeit unsuccessful. The service would take advantage of the RoRo ramp at MT 52 and would probably require minimal alterations to the THC terminal. In all likelihood, the proposal would require government financing and must be regarded as speculative at best.

The Port's general cargo facilities are under–utilized and have excess terminal capacity. It is unlikely that general cargo will reach levels that will fully utilize the facilities. Under-utilization of facilities leads to non-marine uses of port areas, such as land–based container operations and long-term storage of steel products. This situation may offer an opportunity to consolidate general cargo operations in the Port.

The land and terminals the THC leases to others appear to be adequate for private-sector users; the terminals do not appear to be having capacity problems and users seem to be satisfied with the way they operate. As with general cargo, there may be an opportunity to consolidate bulk operations and to use the land more efficiently, on a less *ad hoc* basis.

The port function will remain important to waterfront industries that rely on direct water access to receive raw materials because other transportation options are less likely or not at all feasible. Such businesses as Redpath Sugar, Canada Cement Lafarge, and Lake Ontario Cement might be able to continue operating in the Port without using the THC's port management services, in the same way that Sifto Salt and Goderich Elevator operate in the Port of Goderich.

Other ports in the GTA could physically accommodate some of the Port of Toronto traffic: Oshawa could easily handle steel products and bulk commodities, such as salt. The St. Mary's Cement terminal at Bowmanville could also accommodate more bulk traffic, such as salt.

Relocating traffic to these ports would have disadvantages: it would increase land-based distribution costs to the ultimate consumer. Distributing salt from Oshawa or Bowmanville to the Toronto area might or might not increase the number of trucks on the road, but it would increase the amount of time they are on the road. Over time, it may become difficult to dedicate enough land to store bulk commodities in the Port of Toronto, at which point other GTA ports could provide storage and trans-shipment sites.

Port of Oshawa

The Port of Oshawa appears to be in a situation similar to that of the Port of Toronto: in recent years it, too, has lost sources of major traffic; its terminals are under-utilized; and it is seeking to diversify its traffic base. The harbour commission is currently developing a cement distribution centre capable of handling approximately 150,000 tonnes per year.

The Port also seems to be going through the same evolutionary process as that in Toronto, with various groups and individuals urging that the Port area be used for residential, commercial, and recreational uses. At the same time, port management naturally promotes traditional port uses, so there seems to be no consensus on how to utilize the Port area.

In 1988, the Port of Oshawa ranked 35th among public Canadian ports in tonnage handled. Like Toronto, it serves a local market and, if it is to continue doing so, it must keep attracting new traffic, such as that generated by the cement distribution centre. Otherwise, non-port uses, including the marina, will become more attractive.

The Port has the terminal capacity to handle additional cargo, and if intracity transportation problems in Toronto continue to increase, some user groups may find it advantageous to relocate to the Port of Oshawa.

The Port of Hamilton

Although the Port of Hamilton is not in the subject area of this report, it is worth noting as a facility of national and international significance, surpassing the ports of Toronto and Oshawa. It could accommodate certain bulk commodities and general cargo that currently move through the Port of Toronto.

Private Ports

Options and opportunities are restricted for the private ports in the GTA, which, in general, are dedicated to a specific industrial use. Petroleum docks with pipelines are not necessarily easily converted to other uses. The only private port with realistic potential for expanded use is the St. Mary's Cement terminal at Bowmanville, which handles salt and coal formerly offloaded at the Port of Oshawa. It has current plans to add a second terminal, including a substantial back-up area, which means that any plan to handle additional tonnage would certainly be realistic.

Time or circumstances may make storage and distribution of bulk commodities (such as salt) inappropriate in an urban port such as Toronto. Given concerns about land use and compatibility of the working port and the city, it may be realistic to consider establishing a single location in the GTA to handle certain bulk commodities. Conceptually, the Bowmanville site could provide long-term potential and may be worthy of study and analysis.

Intercity Transportation

The importance of Union Station, not only as a local and regional hub for commuter and other traffic but also as an intercity rail terminal, has been emphasized earlier. It would appear highly desirable to keep the option open for a possible future resurgence of intercity passenger rail travel, reflecting the efficiencies and environmental benefits of this form of travel. At least two possibilities of this nature are currently under investigation. One of these is the formation of a privately owned and operated long-distance commuter rail system centred on Union Station, and providing connections to and from London, Kitchener-Waterloo, Orillia, Peterborough, and Belleville, with possible future connections to Niagara Falls and to Beaverton. A feasibility study of such an operation, backed by Bombardier Inc. and several large Ontario communities, is currently under way.

On a larger scale, the provinces of Ontario and Quebec are jointly investigating the possibility of a private/public enterprise to provide high-speed rail service in the Quebec-Windsor corridor. This could provide rail service at speeds of up to 300 kilometres per hour similar to such services in France, Japan, and elsewhere, using dedicated new track and providing a greatly improved level of service. Some planners might propose that such a line would serve one or more suburban stations (e.g., at Pearson International Airport), rather than penetrating to the GTA waterfront and serving Union Station. Service to Union Station would provide better transit connections throughout the GTA and much better service to the area's prime concentration of employment, the growing downtown population, and tourists wishing to visit the waterfront and CBD. The option of a direct high-speed rail connection to Union Station should clearly be kept open until the feasibility, market penetration, and cost effectiveness of various alternatives have been thoroughly evaluated, and should be taken into account in planning possible changes to Union Station and the rail corridor.

The Toronto Island Airport, as noted earlier, also has potential for increased use as an intercity transportation terminal offering particularly convenient access for those living and working in the central area of the GTA. Decisions in this regard are the responsibility of the City of Toronto, the Toronto Harbour Commissioners, and the federal government under the Tri-Partite Agreement.

Waterborne Passenger Transportation

From the point of view of ground transportation efficiency, Toronto's location on a major lake has been a disadvantage, since its continuing growth as a semi-circle is less efficient than a completely circular form in terms of ground transportation. However, in the context of high-speed marine technology, the lake provides the potential for commuter and recreational passenger links between the Toronto waterfront and urban centres at the western end of Lake Ontario. Such a service was provided several years ago between Toronto and Niagara-on-the Lake/St. Catharines, but could not be sustained owing to operational difficulties and other factors.

A new proposal has been advanced for government consideration using Hovercraft technology. This proposal, by Wavetrain Inc., would include development of 1,000 residential units, associated commercial facilities, and a hotel and resort on a waterfront location in the City of Oshawa, with a high-speed water connection to the Toronto waterfront via Lake Ontario. The proposal would include half-hourly service during rush hours and hourly service during off-peak periods, with special services for ballgames and CNE and other major events. A travel time of approximately 45 minutes port to port is proposed, with all-weather operating capability on a craft seating up to 200 passengers which cruises at 45 knots. An Oshawa-Toronto fare in the range of $6 is mentioned in the proposal. Similar connections could be considered to waterfront locations and urban centres both east and west of

Toronto, including several in the Niagara peninsula. Up to fourteen possible service points have been identified between Oshawa and Burlington.

Much remains to be investigated regarding the financial feasibility and related aspects of such an operation. Again, however, it would appear desirable to investigate such services and, in the meantime, ensure that the option of suitable terminal facilities is kept open on the Toronto waterfront.

3. WHERE TO FROM HERE?

IS MORE TRANSPORTATION REALLY NECESSARY FOR THE WATERFRONT?

As shown in Exhibit 19, there are a number of basic questions to be considered regarding waterfront transportation, including the following:

- How much transportation capacity should be provided?
- What is the appropriate balance among various modes of transportation?
- Which improvements should come first?

Issues which should be addressed in answering such questions include those listed in the exhibit, relating to waterfront objectives, a clear understanding of the various types of transportation demands to be served, the advantages and disadvantages of the various transportation modes and the most appropriate role for each, and the anticipated benefits and costs of specific transportation improvements.

Setting Priorities: How Do We Choose?

Proposed transportation improvements such as those outlined in the previous parts of this paper need to be assessed both technically and in the broader public arena, in the context of overall waterfront objectives.

Among many important questions that must be considered when evaluating each proposed transportation project relative to other proposals are the following:

- Is it compatible with desired land uses?
- Does it provide necessary transportation capacity?
- What is the impact on other transportation modes?
- Does it meet local industrial and commercial requirements?
- Is it comfortable, safe, and convenient?

EXHIBIT 19

SETTING TRANSPORTATION PRIORITIES: SOME BASIC QUESTIONS

How Much Transportation Capacity Should We Provide?

Issues:

- Waterfront objectives: land uses, densities, recreation
- Local transportation: to support waterfront objectives
- Corridor transportation: to serve CBD/other corridor traffic
- Intercity transportation: to serve airport, rail, bus requirements
- Port function: to serve local industrial requirements

What is the Appropriate Modal Balance?

Issues:

- Space limitations for roads and parking
- Greater capacity of transit and rail modes
- Land use/environmental compatibility
- Flexibility for future adaptation
- Long term role of marine transportation, ports

Which Improvements Should Come First?

Issues:

- Waterfront objectives: timing and priorities
- Contribution to meeting capacity/service needs
- Cost and ease of implementation
- Network capability and flexibility

- Is it environmentally friendly?
- Is it energy-efficient per person-kilometre carried?
- How much does it cost to build?
- Can the necessary capital funding be obtained?
- How much does it cost to operate?
- Will the users pay for most or all of it?
- Should the private sector be involved in owning and operating it?
- Can it be integrated with other forms of transportation?
- Can it be adapted or expanded at reasonable cost?

The issues of energy efficiency and environmental impacts are becoming increasingly critical, as humankind continues to test the environmental limits of the planet. There is strong evidence that transportation activities, and particularly automotive transportation emissions, are contributing significantly to acid precipitation, global warming, depletion of the high-level ozone layer, and local toxic effects in and around urban areas. As more is learned about these effects, it can be expected that there will be increasing pressures for regulation and incentives to mitigate them. Near-term and longer-term decisions on transportation improvements should take these factors into account, recognizing that public transit generally consumes much less energy and creates correspondingly reduced emissions per person-kilometre than does individual automotive transport, and recognizing that some fuels (e.g., natural gas, hydrogen) and propulsion systems (e.g., electric motors) will likely have to play an increasingly important role. Developments such as these will be required to achieve the sustainable development necessary for the long-term survival of humankind and other forms of life on earth.

What Is Your Opinion?

The Royal Commission on the Future of the Toronto Waterfront has made it clear that it welcomes comments on waterfront transportation from members of the public. It is hoped that the background information provided in this paper and the questions and commentary provided will assist the public in considering the options, possibly developing new ideas, and providing comments and ideas to the Royal Commission as it considers basic objectives and related transportation requirements for this important part of the Greater Toronto Area.

COMMISSION REPORTS AND WORKING PAPERS

Reports and working papers published by the Royal Commission on the Future of the Toronto Waterfront are available in both English and French. Publications may be obtained by contacting Andrea G. Short, Publications Co–ordinator, at the Royal Commission on the Future of the Toronto Waterfront, 207 Queen's Quay West, 5th Floor, P.O. Box 4111, Station A, Toronto, Ontario M5W 2V4.

Requests for information or comments about the content of the Commission's reports may be directed to Beverly Morley, Director of Community Relations.

1. *Environment and Health: Issues on the Toronto Waterfront*. Royal Commission on the Future of the Toronto Waterfront. Environment and Health Work Group. ISBN 0–662–16539–2. DSS cat. no. Z1–1988/1–41–1E
2. *Housing and Neighbourhoods: The Liveable Waterfront*. Royal Commission on the Future of the Toronto Waterfront. Housing and Neighbourhoods Work Group. ISBN 0–662–16936–0. DSS cat. no. Z1–1988/1–41–2E
3. *Access and Movement*: Royal Commission on the Future of the Toronto Waterfront. Access and Movement Work Group. ISBN 0–662–16937–9. DSS cat. no. Z1–1988/1–41–3E
4. *Parks, Pleasures, and Public Amenities*. Royal Commission on the Future of the Toronto Waterfront. Parks, Pleasures, and Public Amenities Work Group. ISBN 0–662–16936–0. DSS cat. no. Z1–1988/1–41–4E
5. *Jobs, Opportunities, and Economic Growth*. Royal Commission on the Future of the Toronto Waterfront. Jobs, Opportunities and Economic Growth Work Group. ISBN 0–662–16939–5. DSS cat. no. Z1–1988/1–41–5E
6. *Persistence and Change: Waterfront Issues and the Board of Toronto Harbour Commissioners*. Royal Commission on the the

Future of the Toronto Waterfront. Steering Committee on Matters Relating to the Board of Toronto Harbour Commissioners. ISBN 0–662–16966–2. DSS cat. no. Z1–1988/1–41–6E

7. *The Future of the Toronto Island Airport: The Issues.* Royal Commission on the Future of the Toronto Waterfront. ISBN 0–662–17067–9. DSS cat. no. Z1–1988/1–41–7E

8. *A Green Strategy for the Greater Toronto Waterfront: Background and Issues.* Ron Reid, Rob Lockhart, and Bob Woodburn. Royal Commission on the Future of the Toronto Waterfront. ISBN 0–662–17671–5. DSS cat. no. Z1–1988/1–41–8E

Interim Report August 1989. Royal Commission on the Future of the Toronto Waterfront. ISBN 0–662–17215–9. DSS cat. no. Z1–1988/1E

Working Papers

A Selected Bibliography on Toronto's Port and Waterfront
CAT Z1–1988/1–42–1E
ISBN 0–662–17596–4

An Index to the First Interim Report
CAT Z1–1988/1–42–2E
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Urban Waterfront Industry: Planning and Developing Green Enterprise for the 21st Century; a Report of the Symposium, November 16, 1989
CAT Z1–1988/1–52–1E
ISBN 0–662–17640–5